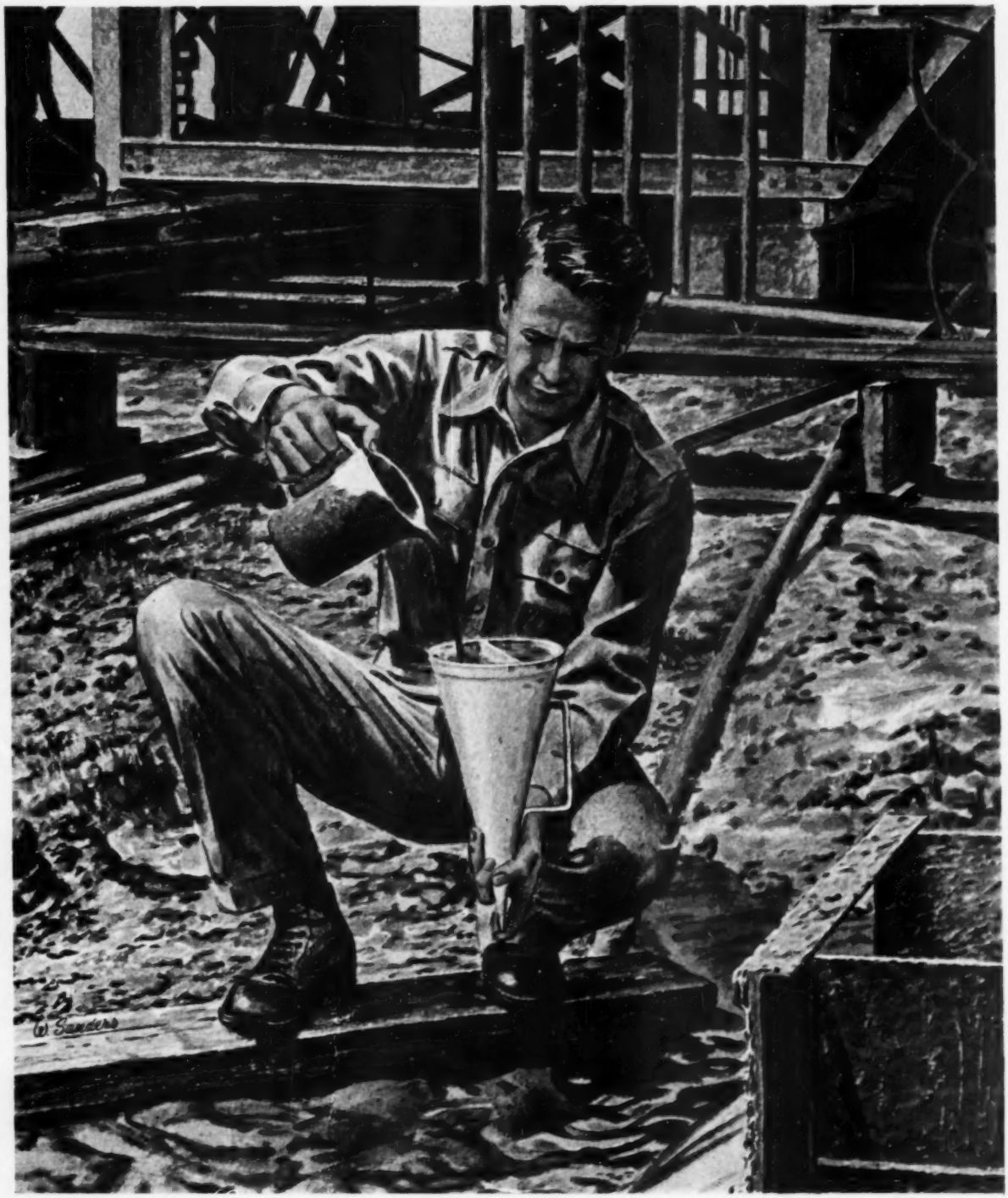
orld etroleum



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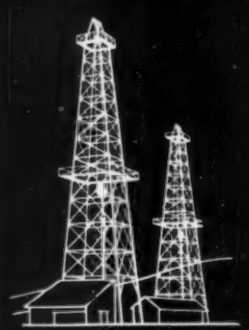

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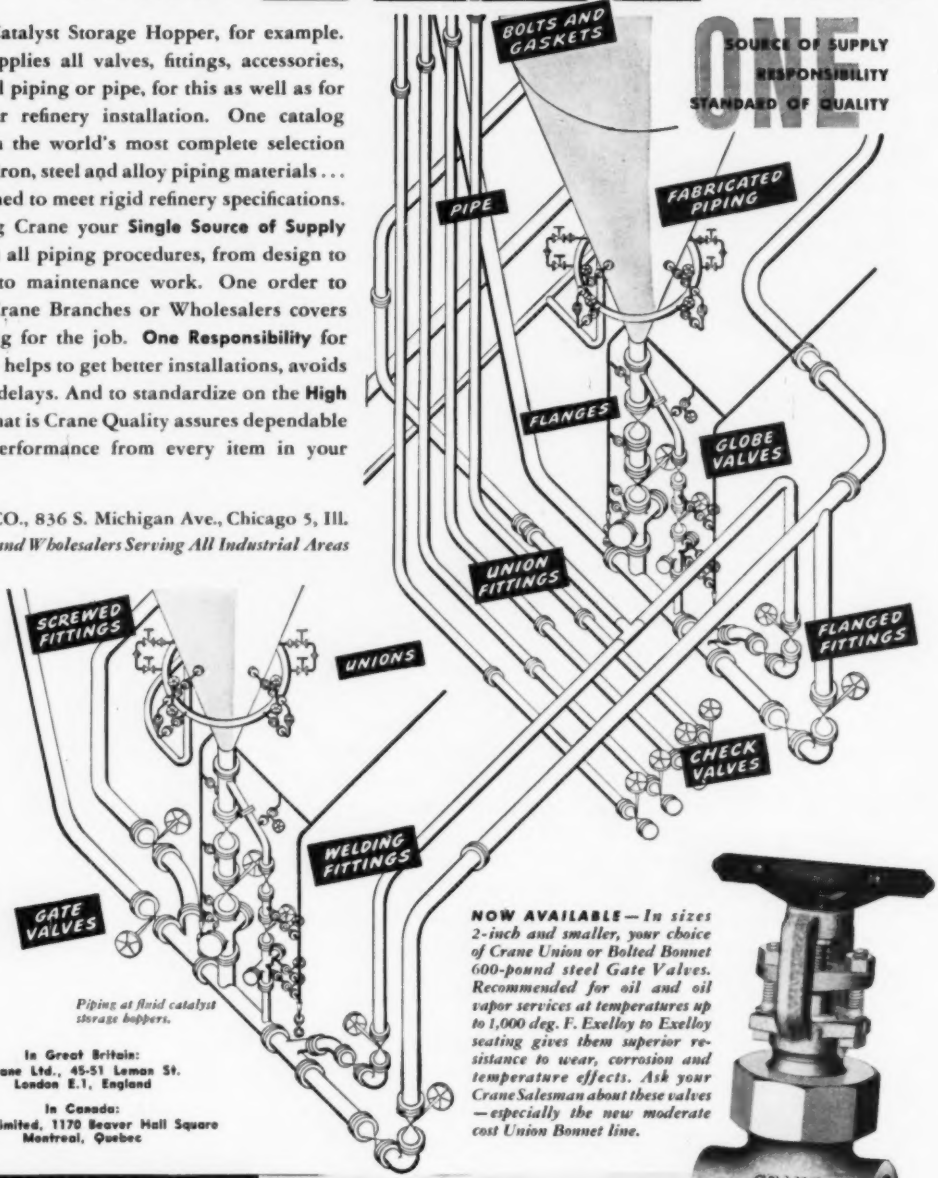

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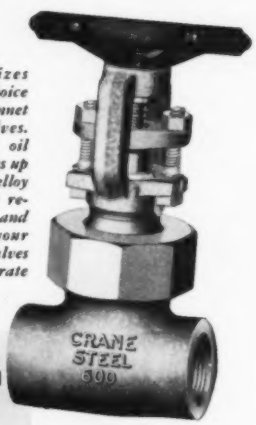

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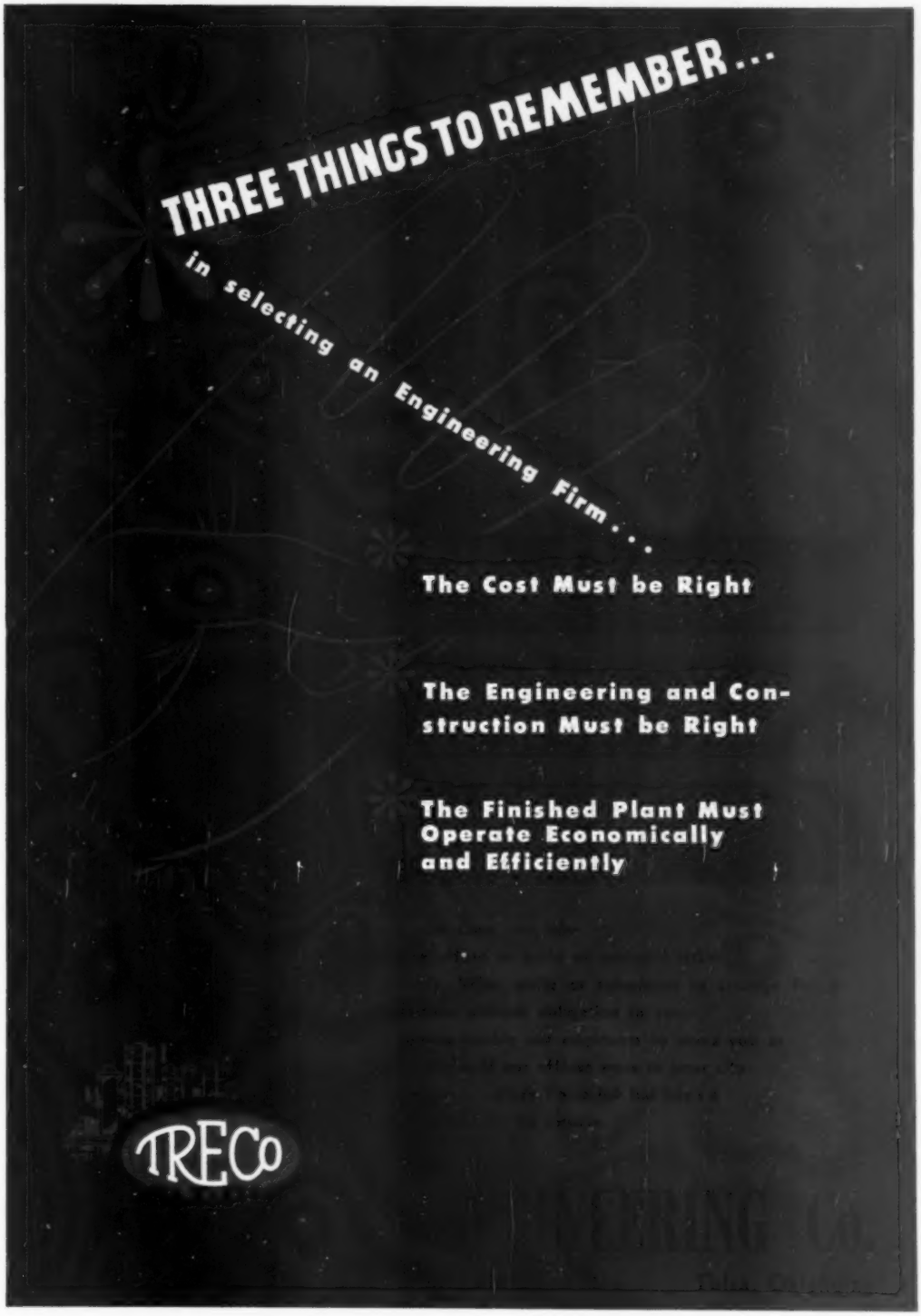
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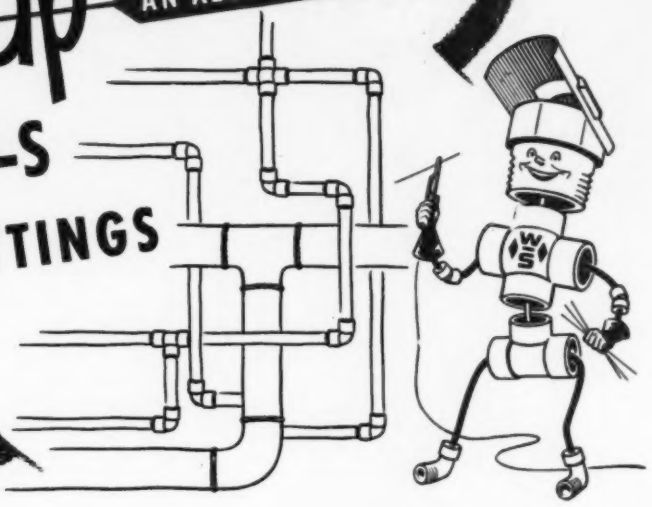

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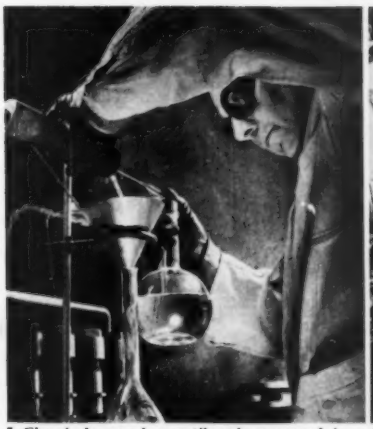
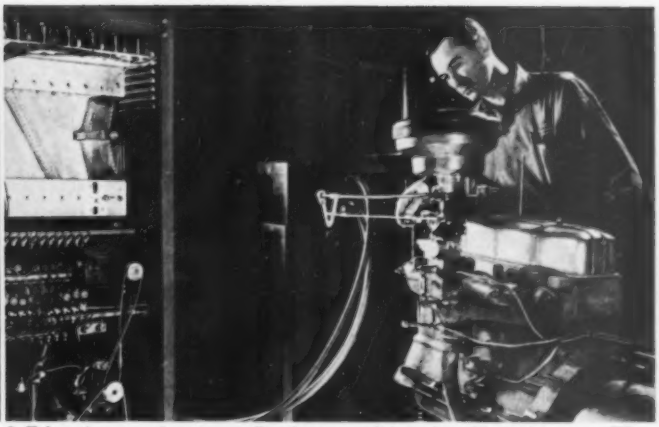


1. Chemical research on antiknock compounds has been a continuous program at Ethyl for 26 years.



2. Exhaustive research on new antiknock compounds is conducted in the laboratory. When results are favorable, these new fluids are proved in road test vehicles and in commercial fleets.

DEVELOPING AND PROVING "ETHYL" ANTIKNOCK COMPOUNDS OF THE FUTURE

THE manufacturer of antiknock fluid has an obligation to refiners to do far more than manufacture a given compound. He must constantly improve his product and keep it up-to-date in terms of the gasoline with which it will be blended to insure maximum quality when added to the gasolines produced by the petroleum industry and used in the engines produced by the automotive industry. Thus technical advances in these two industries must be matched by equivalent advances in the formulation of "Ethyl" antiknock compound.

How well the Ethyl Research Laboratories have lived up to this obligation is indicated by the numerous changes—five of them major improvements—which have been made in "Ethyl" antiknock compound during the twenty-six years it has been marketed.

More than tetraethyllead

While tetraethyllead is the principal ingredient of "Ethyl" antiknock fluid, it is only one of a number of ingredients. Determining the most suitable other ingredients and their most effective proportions has always been a major part of the research program of the Ethyl Laboratories.

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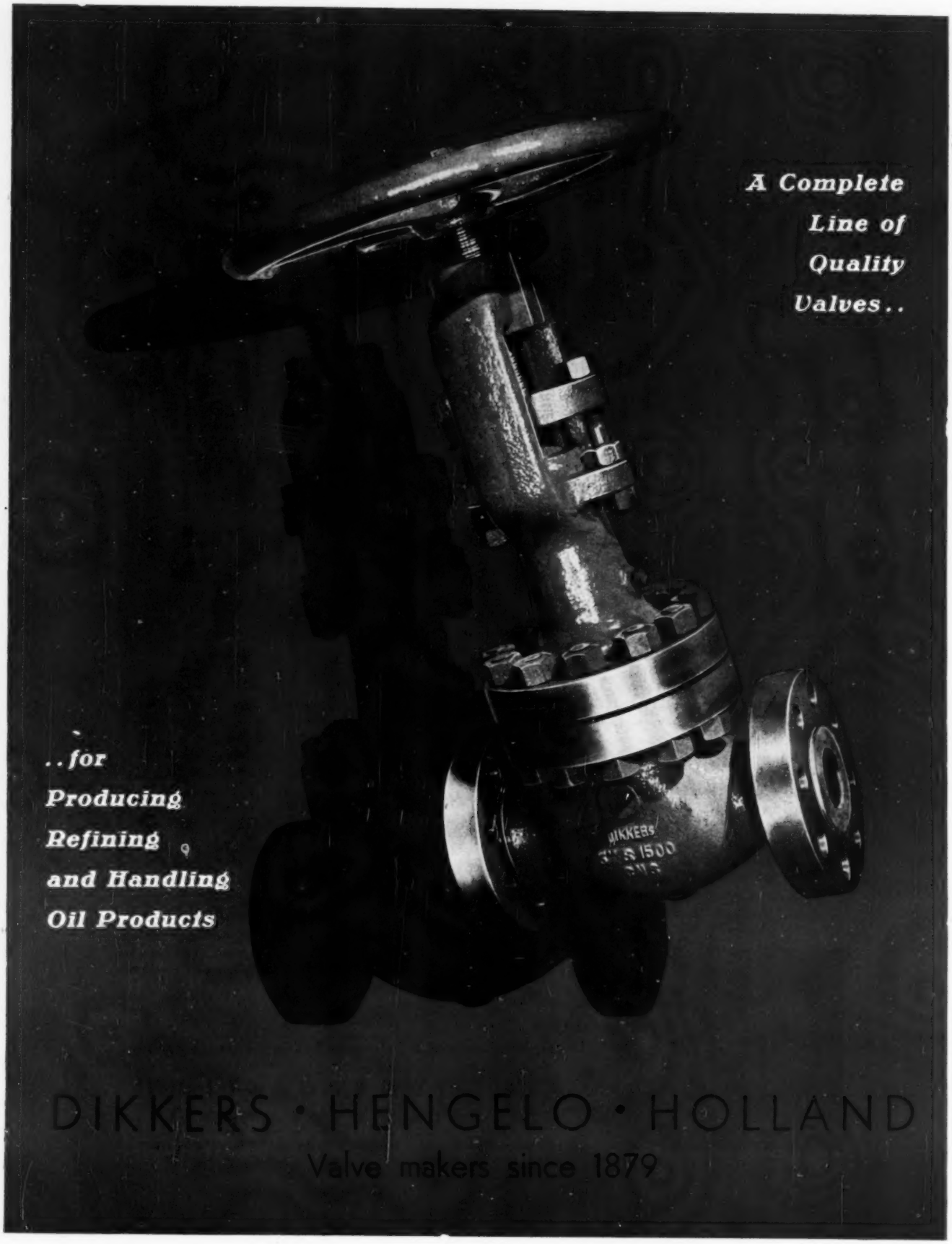
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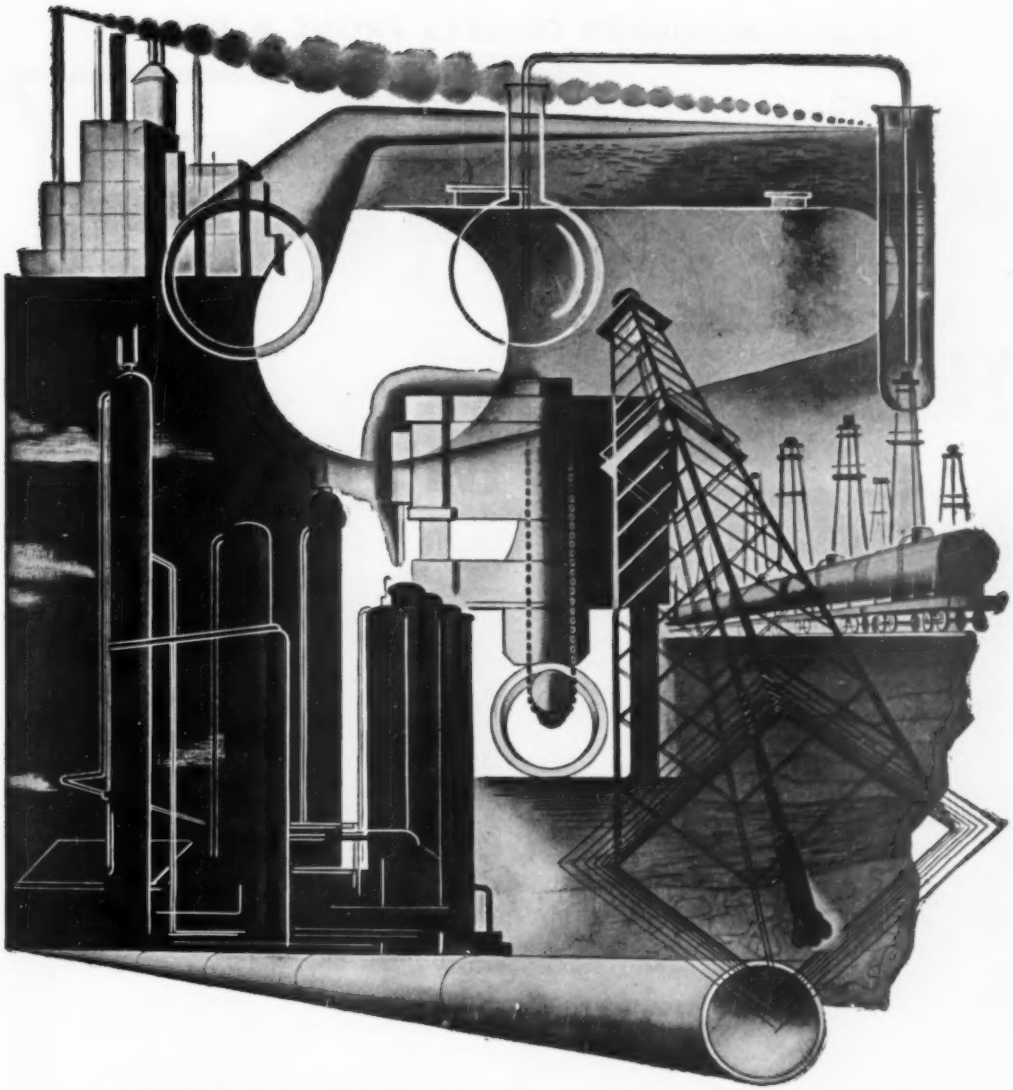

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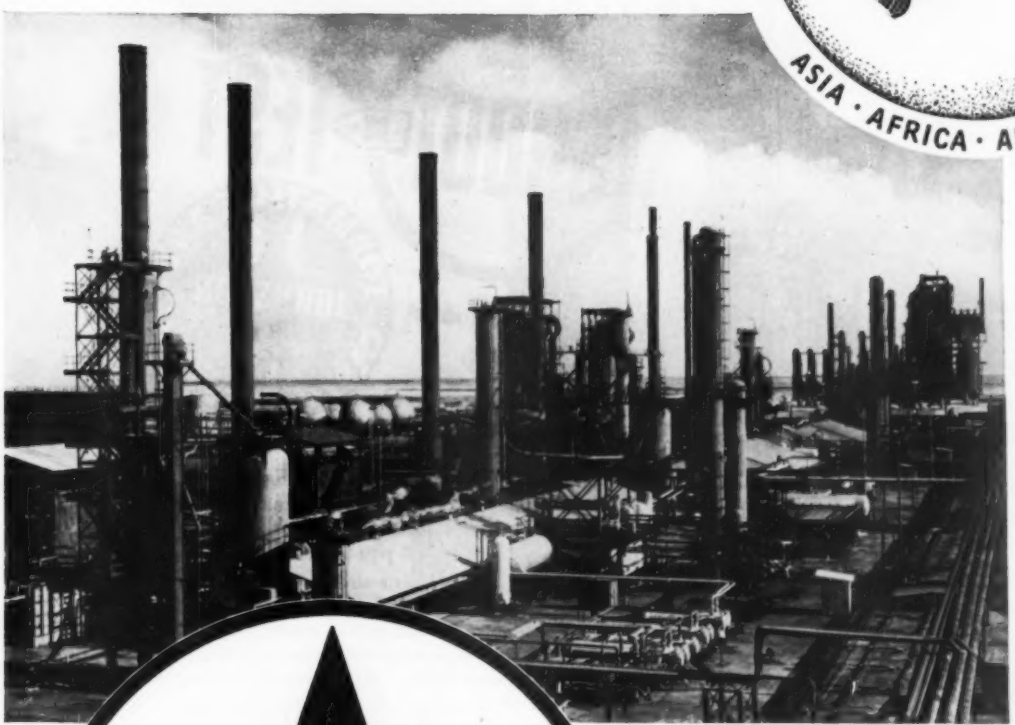

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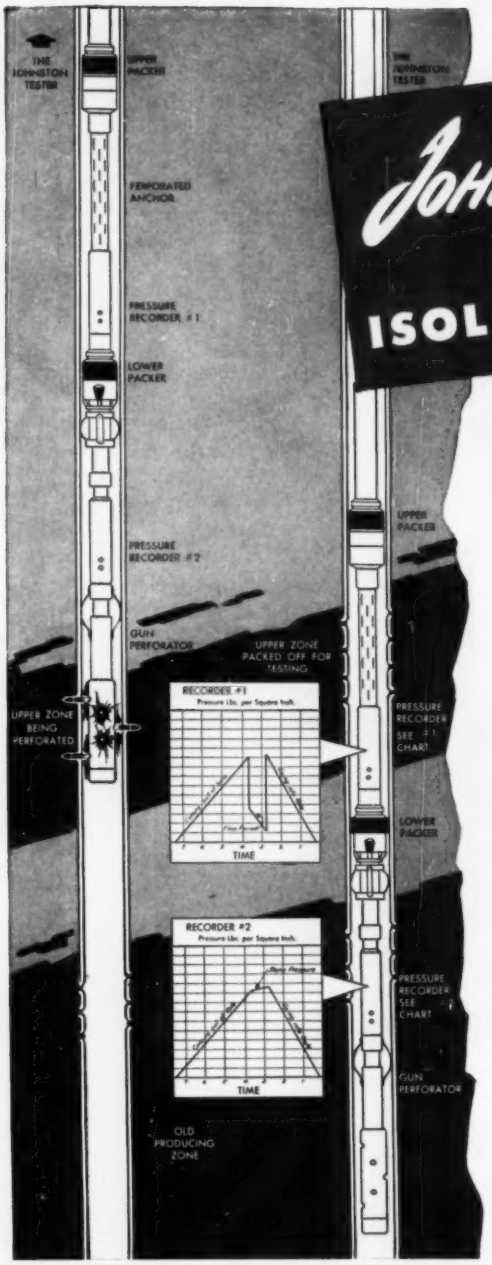

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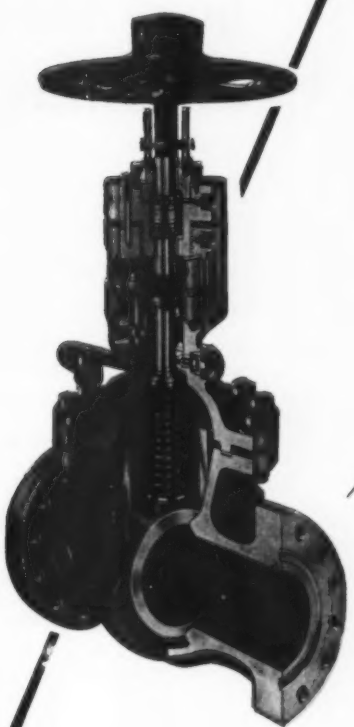

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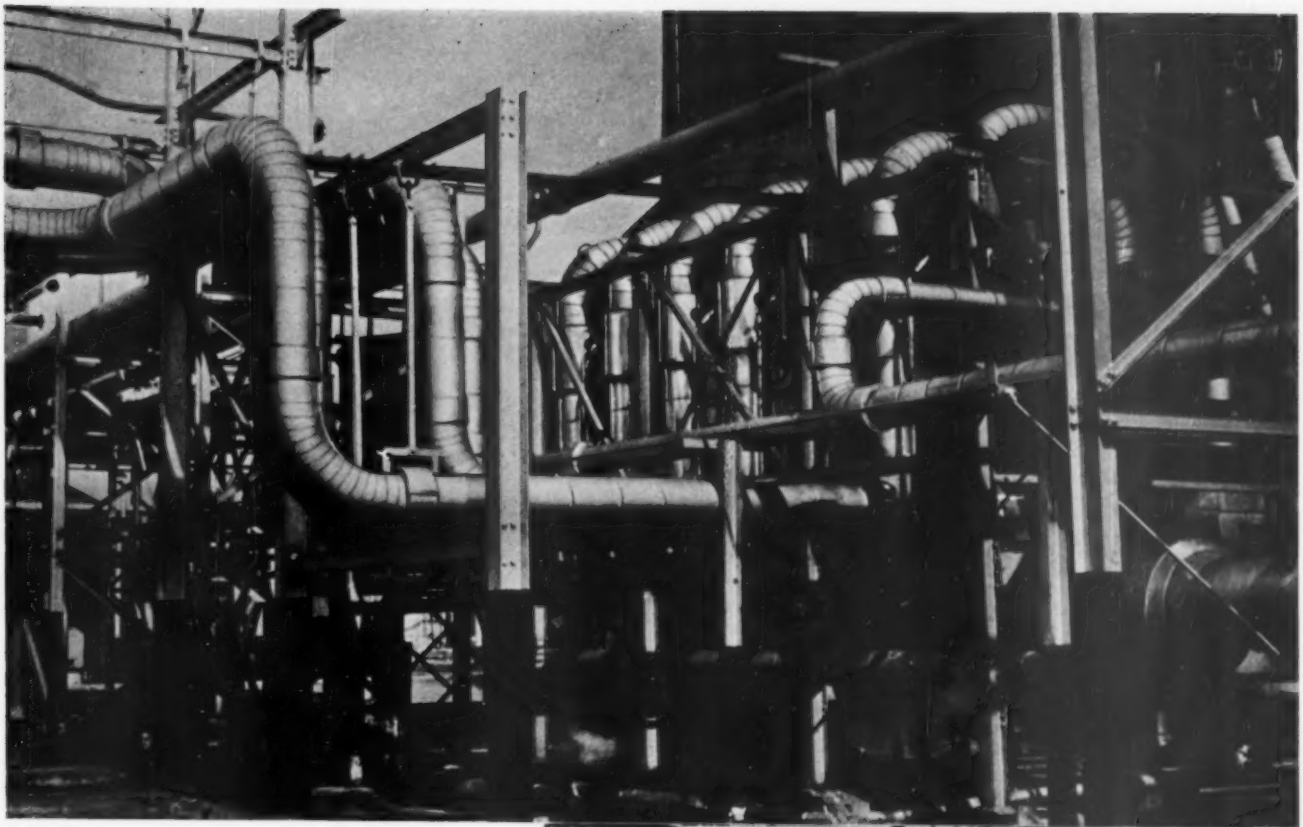

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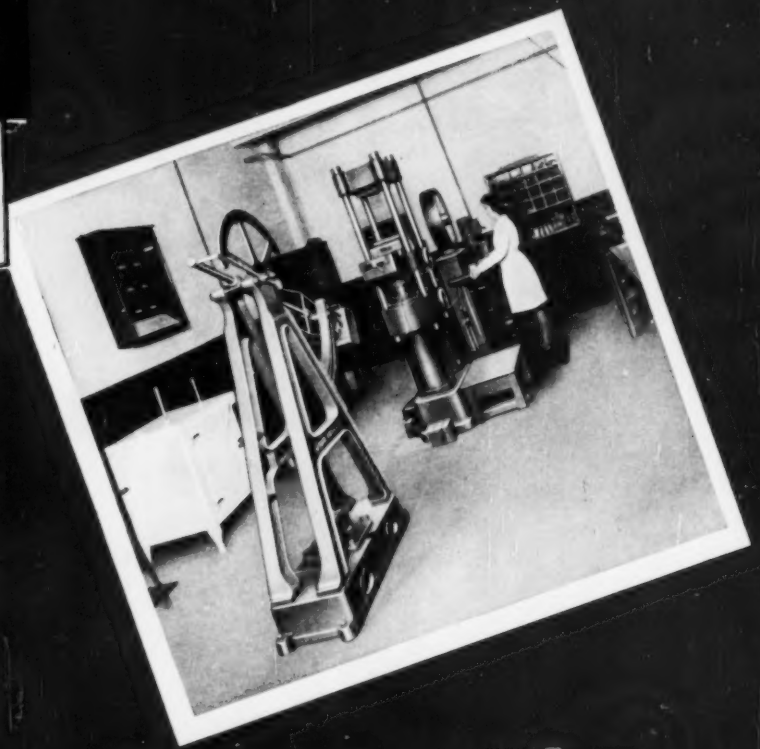

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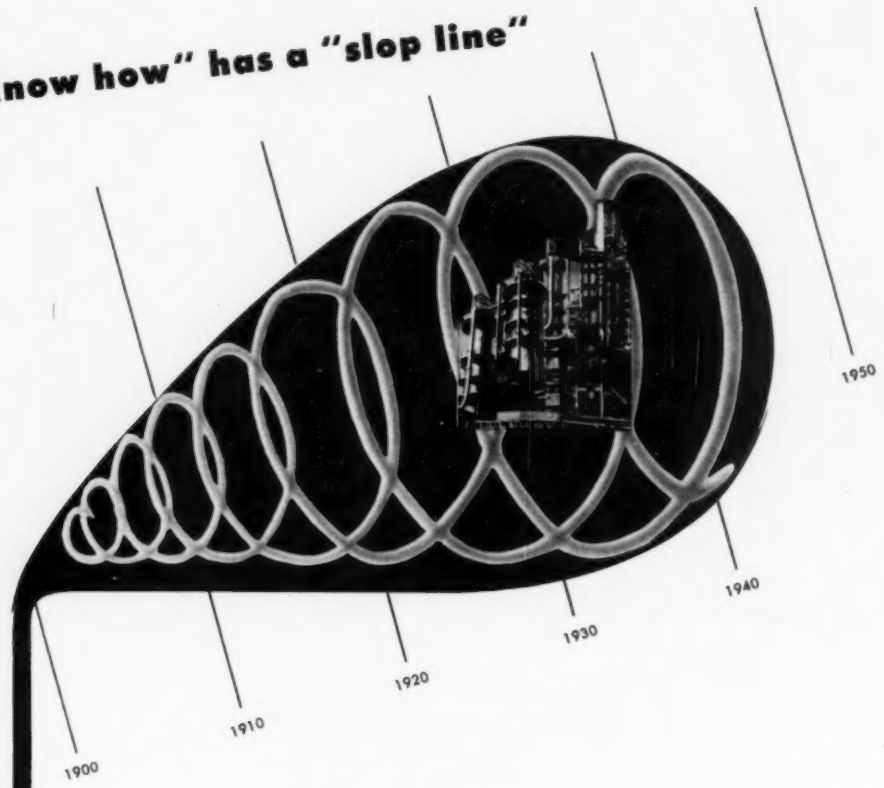
"know how" has a "slop line"



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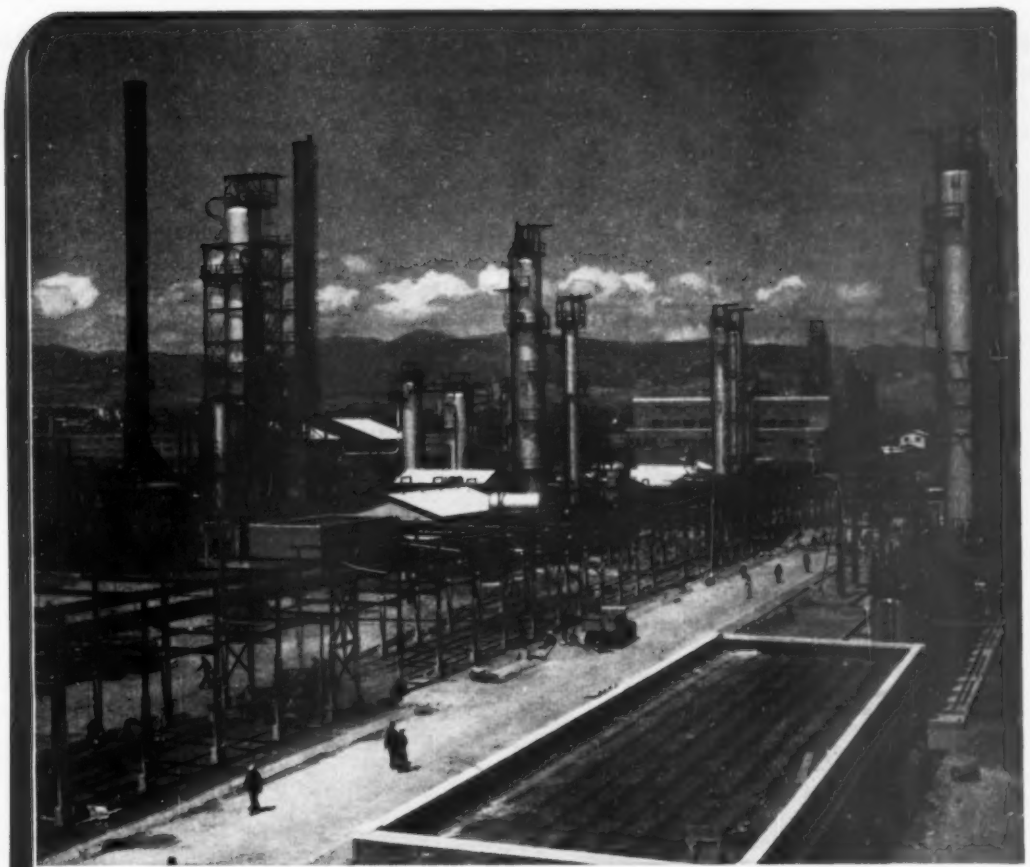

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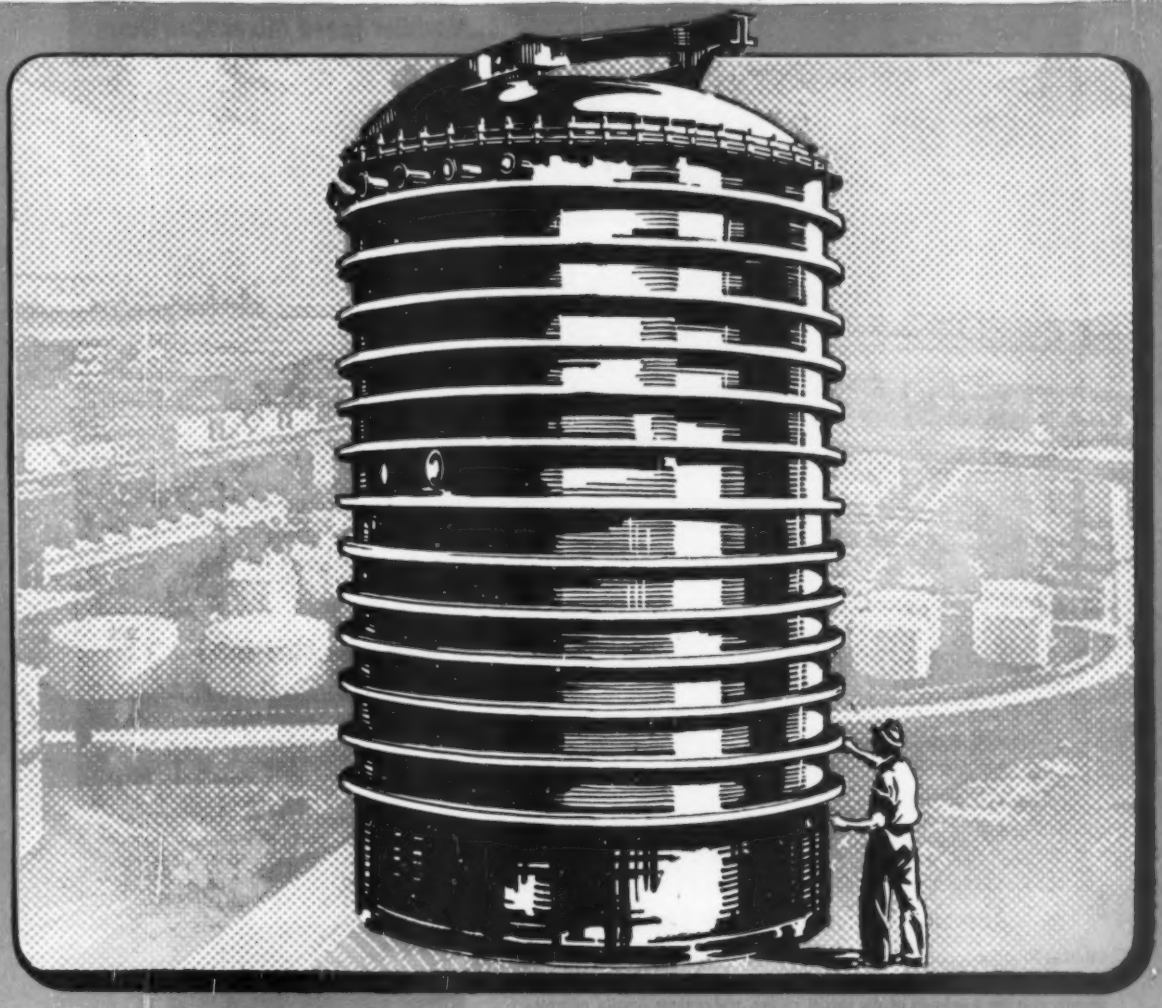

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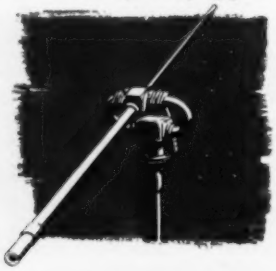
There is a Patterson-Ballagh Mud Gun for every mud program

heavy duty type



...Muddler *Speed Mixer* Mud Gun

Heaviest duty model. Adaptable to any mud mixing job found in oil fields. Features dual mixing chambers. Can be adjusted and locked in any position from horizontal to vertical flow. Flexible and easy to operate—non-spin. Made specifically for breaking up mud conditioning materials.
Rotating parts that contact packing glands are polished chrome faced to reduce friction, add life to packing, and prevent "freezing" between jobs. Pressure tested before shipment.
Lubricated through grease gun fittings.

general utility type

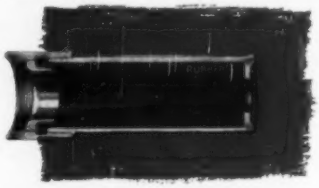
...Midlean *Non-Spin* Mud Gun

Economical general utility mud gun of the high pressure type which offers all the safety features found on more expensive guns. Practical for most installations. Equipped with positioning handles for horizontal and vertical adjustments.
Polished chrome faced glands for reduced friction, increased packing life, and prevention of "freezing." Gun is pressure tested to 200% of rated pressure by component parts and as an assembly.

bottom types

Bottom Type Mud Guns

MUREX—as illustrated. Mounted on side for tank type mixing. Easily adapted for jetting at bottom to any height inside tank with alternate lengths of vertical pipe.
Absolutely non-spin and swivel will not "freeze." Unit can be quickly connected by a hammer or flange union. Adaptable to open or covered tanks.
MULTURE—Designed for center tank operation in storage tanks where mud will remain idle for a period of time. Double Patterson-Ballagh nozzles insure perfect mixing of large volumes.



Abrasion Resistant *Rubber Lined* Nozzles

Rubber lined nozzles are standard equipment on all Patterson-Ballagh Mud Guns. Note how metal sleeve keeps mud from seeping behind rubber lining. This feature, plus the toughness of the special rubber, makes these nozzles outwear those of metal design. Chrome tungsten alloy lined nozzles are available for jetting oil base and chemical muds. Check the new Composite Catalog and then order Patterson-Ballagh Mud Guns for your operation.

Regardless of the volumes and pressures encountered in any mud program, there is a Patterson-Ballagh Mud Gun and Mud Gun Nozzle that will give long, efficient, and economical service.

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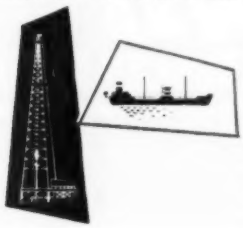

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PUBLISHED BY MONA PALMER

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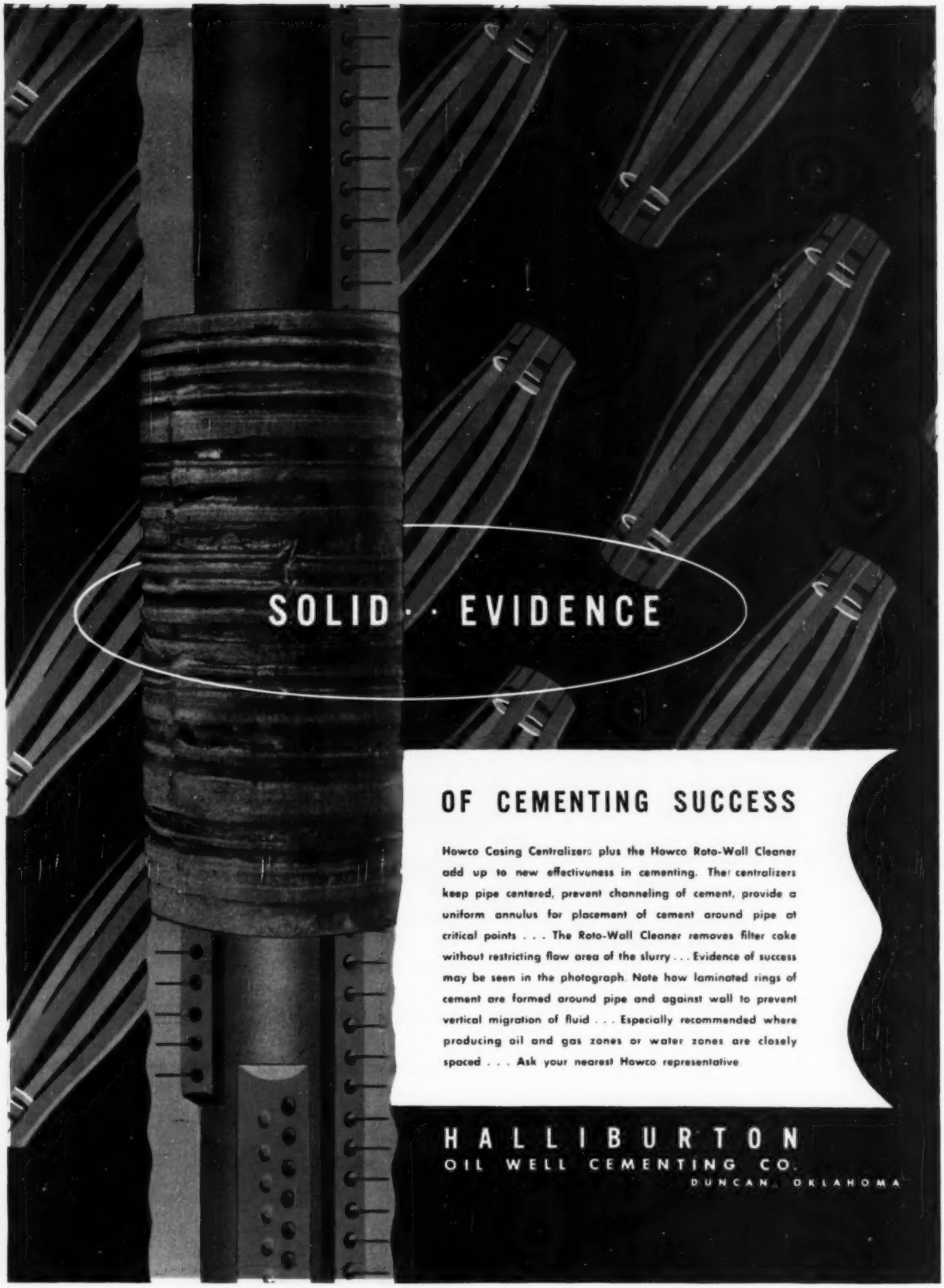
THIS MONTH'S COVER—W. C. Goins Jr., a Gulf Oil Corp. mud engineer with that company's Houston chemical laboratory is pictured preparing to test drilling mud for viscosity with the Marsh funnel and cup. In this test the time required for 1,000 cc. of mud to run into the graduate is measured in seconds. Control of mud quality is becoming increasingly important in modern drilling operations. Color plates for this month's cover were supplied through courtesy of The Orange Disc, house magazine of Gulf Oil Corp.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EDITORIAL

INDUSTRY'S CHIEF HAZARD IS UNWISE LEGISLATION

CUSTOM has decreed the turn of the year as a time when the business world attempts to take stock of the situation and to estimate the probable course of events during the coming twelvemonth. The forecasts do not always prove accurate —conditions in the unsettled state of present world affairs are subject to sudden changes—but they do provide a consensus of individual opinion in various sections and in varying lines of industry.

Analysis of the views expressed by business executives, economists and others in the early weeks of 1949 shows that they are characterized by a tone of cautious optimism. It is generally agreed that the peak of living costs has been passed with the continued slow decline in the prices of consumer goods. Firmness still rules the markets for durable goods, and some advances have been recorded recently in heavy equipment as a result of rising wage and transportation costs. Most commentators feel that recent developments on the whole have been favorable rather than otherwise. Purchasing power in the hands of consumers remains high, and the fact that the buying craze is over and that the public shows increasing discrimination in its spending is regarded as marking a trend toward a better balance in the domestic economy. Inventories are being carefully controlled. Labor disputes have decreased throughout the past year and are increasingly settled by negotiation. Though it is too early to form definite opinions as to agricultural production, conditions thus far are favorable and farm income seems likely to be as high or higher than in the past year, even though prices may be more moderate. While some decline in business income and in 1948's record-breaking figure of employment is anticipated, neither will necessarily reach disturbing proportions.

At the same time it is realized that this encouraging trend might quickly be reversed either by unfavorable international developments or by unsound domestic legislation. The confidence of investors has not been restored, as is evidenced by the action of securities markets and by the fact that the bulk of the vast expenditures by business during the past two years in expanding plant and equipment to meet growing demand for its products has had to come from the reinvestment of earnings and the use of funds ordinarily assigned to surplus or depreciation accounts or disbursed to shareholders in the form of payment for the use of their capital. Should these sources of supply, already inadequate to meet industry's needs, be additionally depleted by the imposition of excess profits or heavier corporate taxes, it would further repel individual investors and force the abandonment of capital projects essential to the growth of business and the maintenance of a high level of employment. Tax burdens have reached about the limit that the country's economy can support and continued raising of rates is likely to result in lower rather than higher returns, while at the same time setting off a declining spiral of business activity and employment disastrous in its consequences.

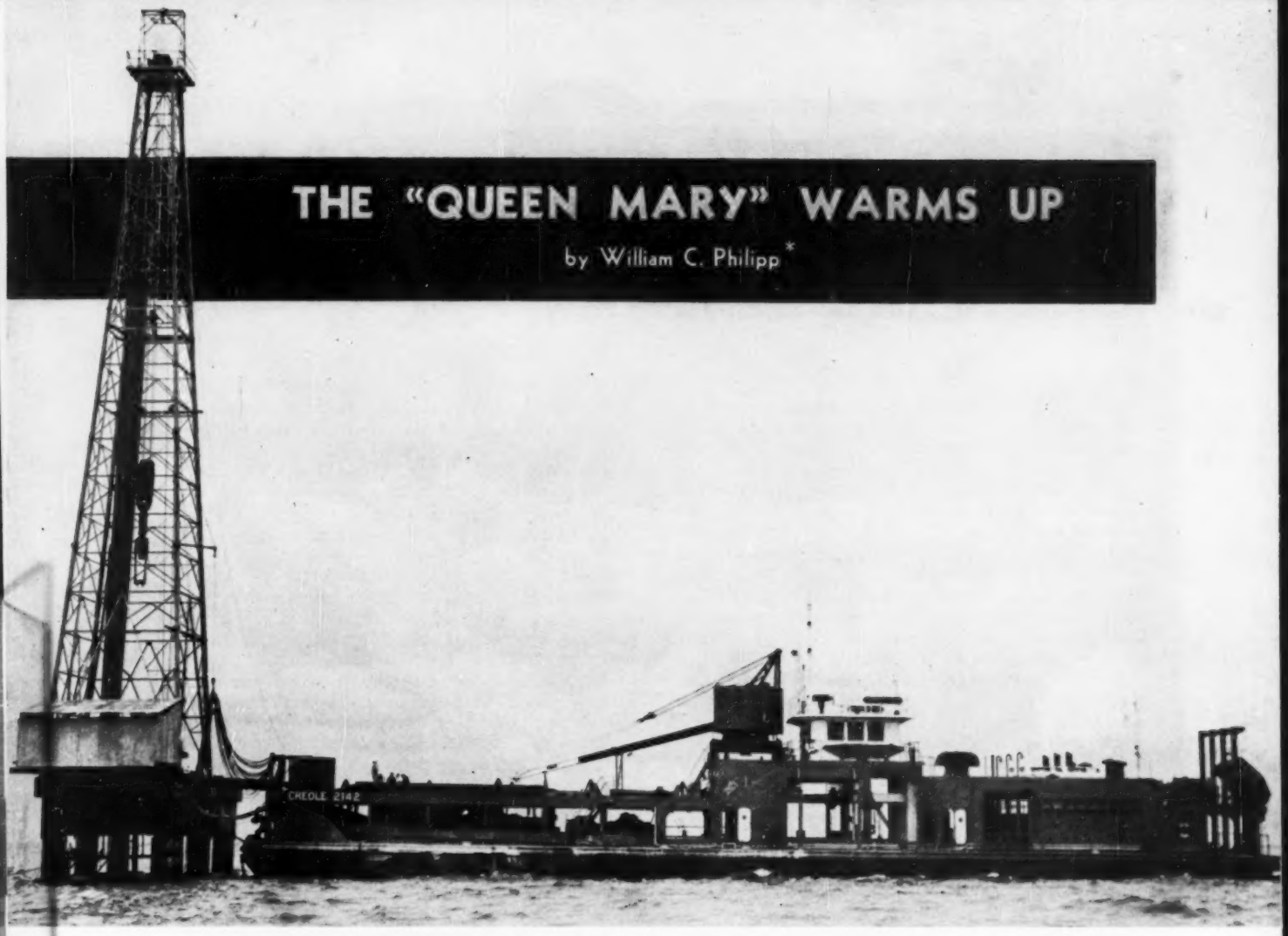
For the oil industry the outlook for the year is highly encouraging, aside, of course, from any development that might bring about a widespread business collapse. During the past year the industry accomplished a prodigious feat by keeping production well ahead of the growth in consumer demand and raising the stocks of crude and products to levels that have banished all talk of shortage.

This stabilization of the supply situation, which has proceeded to the point where it has been possible to relieve the pressure on certain fields and bring them well within the limits of maximum efficient production, has been brought about in spite of difficulties in obtaining materials and equipment essential to production and transportation, such as drill pipe, casing and line pipe. Now, with the steel industry promising a record output during 1949 and with delays in the delivery of machinery and supplies steadily decreasing, oil operators are facing enhanced prospects of adding to production, enlarging refining capacity and constructing pipelines that are urgently needed. It is noteworthy that in all divisions of the industry the elaborate programs of expansion adopted during 1947 and 1948 are being pushed with undiminished energy and that the expenditures for new facilities in the coming twelvemonth are expected to equal or more probably to exceed any previous year.

Experience of the trying postwar years has amply demonstrated that there is no question of the ability of the oil industry to supply all peacetime needs as they arise. That, however, does not satisfy the military authorities who want to see a "safe" reserve production of at least a million barrels daily developed to meet a possible emergency that might threaten national security. At the same time the federal administration is seeking to impose a handicap on one of the most promising means of attaining this position by taking away from the individual states their historic control over bordering waters and placing these reservoirs under the jurisdiction of Washington bureaus. The issue is still open to final decision, but in view of the ineptitude of federal agencies in their past handling of oil lands under their authority, it raises a question that deserves the careful consideration of Congress.

THE "QUEEN MARY" WARMS UP

by William C. Philipp*



Creole No. 2142 diesel-electric drilling barge engaged in supplying power to Tia Juana No. 280 in Lake Maracaibo, Venezuela, first well to be drilled by the new barge. Ten-ton crane mounted beside living-quarter cabins handles materials without services of special derrick barge.

THE Creole Petroleum Corporation's new seagoing barge No. 2142 was riding at anchor in queenly fashion some fifteen miles out in Lake Maracaibo early one hot morning in October 1948. Toolpushers, Venezuelan drillers and roughnecks, petroleum and electrical engineers were clearing her decks for action. Those on board were probing her vitals for close-ups of all the equipment installations that have gone into making this barge No. 2142 the most formidable weapon Creole has developed to probe the secrets of geolological formations far below the surface of Lake Maracaibo. The occasion for this activity—barge No. 2142 was ready to furnish electrical power to be used in "spudding-in" Tia Juana location No. 280.

Undoubtedly the living quarters on board the barge and the unique features tending to make her self-sufficient—to say nothing about her 174 by 70-foot and 12-foot draft dimensions—had much to do with the men of Creole dubbing her the "Queen Mary." Accommodations such as shower and toilet facilities, mattress bunks, desk and lockers found in each of the two top-deck bunkrooms separated by combination radio room and galley—with refrigeration and hot plates, are conveniences not found on the ordinary drilling rig. However, these conveniences will become absolute necessities when the barge ties up at some of the isolated wildcat locations planned for her. Those who learn of these remote locations appreciate for the first time the problems influencing the overall design of a barge for deep drilling. They realize that here is a complete drilling unit that will still be operating 20 years hence, which is the principal reason an electric drive was chosen. All other equipment, including materials going into construction of the barge itself, were carefully selected on the same basis, with an eye to ruggedness, longevity and consequent minimum maintenance costs.

The "Queen Mary" is an outstanding development—a tribute to the vision of Creole management, the engineering talent of John H. Bowman equipment engineer, and others, the drilling background of James Lofton, drilling superintendent, Lagunillas, and the cooperation of the marine department of Standard Oil (N.J.) which designed the barge. E. H. Lamberger, Westinghouse drilling and production specialist, coordinated the design and manufacture of all the electrical equipment involved. The barge was built and all equipment assembled by the Avondale Marine Ways Inc., at Avondale, Louisiana. After completion early in July 1948, a tug towed her through the Caribbean to Lake Maracaibo.

The barge is divided on the main deck into an engine room, a pump room and a mud storage and tool room. In the engine room three Westinghouse 400-kilowatt direct-current generators, driven by slow-speed Clark diesel engines, make up the main power plant furnishing all the electricity needed for drilling purposes at 395 volts. Four 75-kilowatt, DC auxiliary generators supply power at 125 volts for lighting, blower motors, shaleshaker, etc. The main control panel is located along the bulkhead adjoining the pump room.

The pump room is equipped with three Oilwell 220P main mud pumps, each driven by motors rated 500 hp. In addition there is a mud mix pump driven by a 60 hp motor. A mud suction pit of approximately 400-barrel capacity adjoins four 500-barrel fluid mud storage tanks. Ade-

* Petroleum Section, Westinghouse Electric International Company.

quate suction and discharge manifolding connects pumps and the various tanks. Facilities for mud cooling and agitation have been installed.

In operation the barge will be towed close to the derrick structure (mounted on caissons) and anchored by means of four anchor winches, each located in one corner of the main deck and powered by 25 hp motors. Electric cable connections are quickly made between the barge power and the motors located on the derrick floor. The making and breaking of cable connections is simplified by plug and receptacle arrangements for both power and multi-conductor control cable. The receptacles are mounted on terminal board structures, one of which is mounted in the bow of the barge and the other on the drawworks motor bedplate. When tearing down and moving off location, the electric cable is stored on the port corner of the barge pipe deck. The main electrical circuit is a simple modification of the Ward Leonard system, permitting smooth operation of motors under conditions of widely varying loads without the use of resistors to control speed. The rig and power barge were designed overall for maximum flexibility, reliability and continuity of service.

The rig equipment on the derrick floor includes a National 34FE10 steam type drawworks which is chain-driven by a motor rated 800 hp. but momentarily capable of 1575 hp. An Oilwell 27½-inch rotary table is direct-connected to a 300 hp motor. Other equipment on the floor includes the driller's meter cabinet, foot-operated spin-out switch, control wheels and push-button station. The meter cabinet is placed so that the driller can see at a glance how much load he has on each motor. Klaxons have been installed on the main motor circuits to make sure immediate attention is given to an overloaded motor

The caissons, which constitute a permanent derrick foundation, are an interesting story in themselves. Creole fabricates these caissons in its La Salina camp on Lake Maracaibo by taking a four or five-foot diameter steel cylinder, 15 feet in length, and pouring an approximate half-foot of concrete (reinforced) around the periphery of the pipe by means of steel molds built for this purpose. These 15-foot hollow sections are welded together into lengths as great as 185 feet. The total length of the caissons required at some specific drilling site will, of course, be governed by total depth of the water plus penetration of the caisson into lake bottom. Usually four of these assembled lengths of caissons are floated out to the well location where they are picked up and accurately positioned by a "caisson-setting barge."

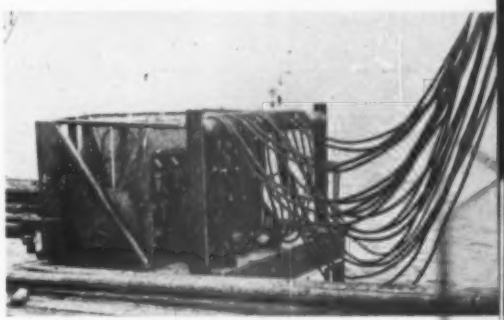
A secure foundation on the lake bottom is attained by gradually adding weights, up to 200 tons, on each caisson. The caissons are then connected by prefabricated steel portal braces. After a prefabricated steel platform is laid, a drilling derrick with a 24-foot base is erected. Since more than one producing horizon is encountered under the lake, Creole mounts a single drilling derrick on slide rails, thus enabling the drillers to complete one well, skid the rig and drill a "twin" well, all from the same caisson structure. In such twin locations, six caissons are used instead of four.

Such procedures hold for wells drilled to depths of 4,000 to 5,000 feet. However, the arrival of the "Queen Mary" has posed another engineering problem, that of designing a permanent derrick foundation suitable for drilling to far greater depths.

The "Queen Mary" was set up on Tia Juana No. 280 to drill and complete a twin, the sister well having been previously drilled by another rig. The total projected depth of only 4,600 feet to a producing sand was only a warm-up to the "Queen" since she was designed to drill to 15,000 feet and below. This shakedown test served to eliminate any "bugs" in the equipment and to familiarize the rig personnel with the great amount of flexibility possible by simple manipulation of the controls. The advantage of being able to secure at the drawworks instantly 100 percent of the power generated can be a very important factor when trouble suddenly develops in a hole below 10,000 feet. Telephone communication between the driller's station, engine room, office, pump room and anchor winches permits fast coordination of activities during normal operations, particularly in emergencies.

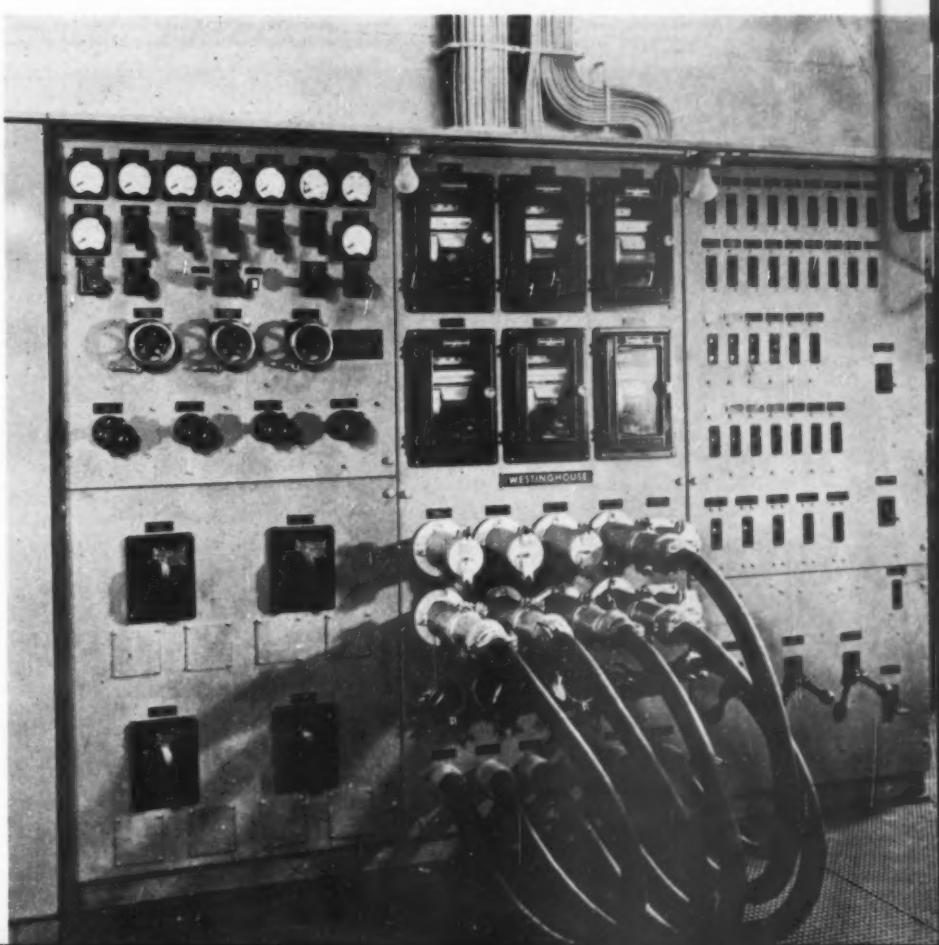
Lake Maracaibo can erupt some violent storms without much advance notice. Waves have been known to reach heights of 20 feet and have occasionally overturned large barges. The "Queen"

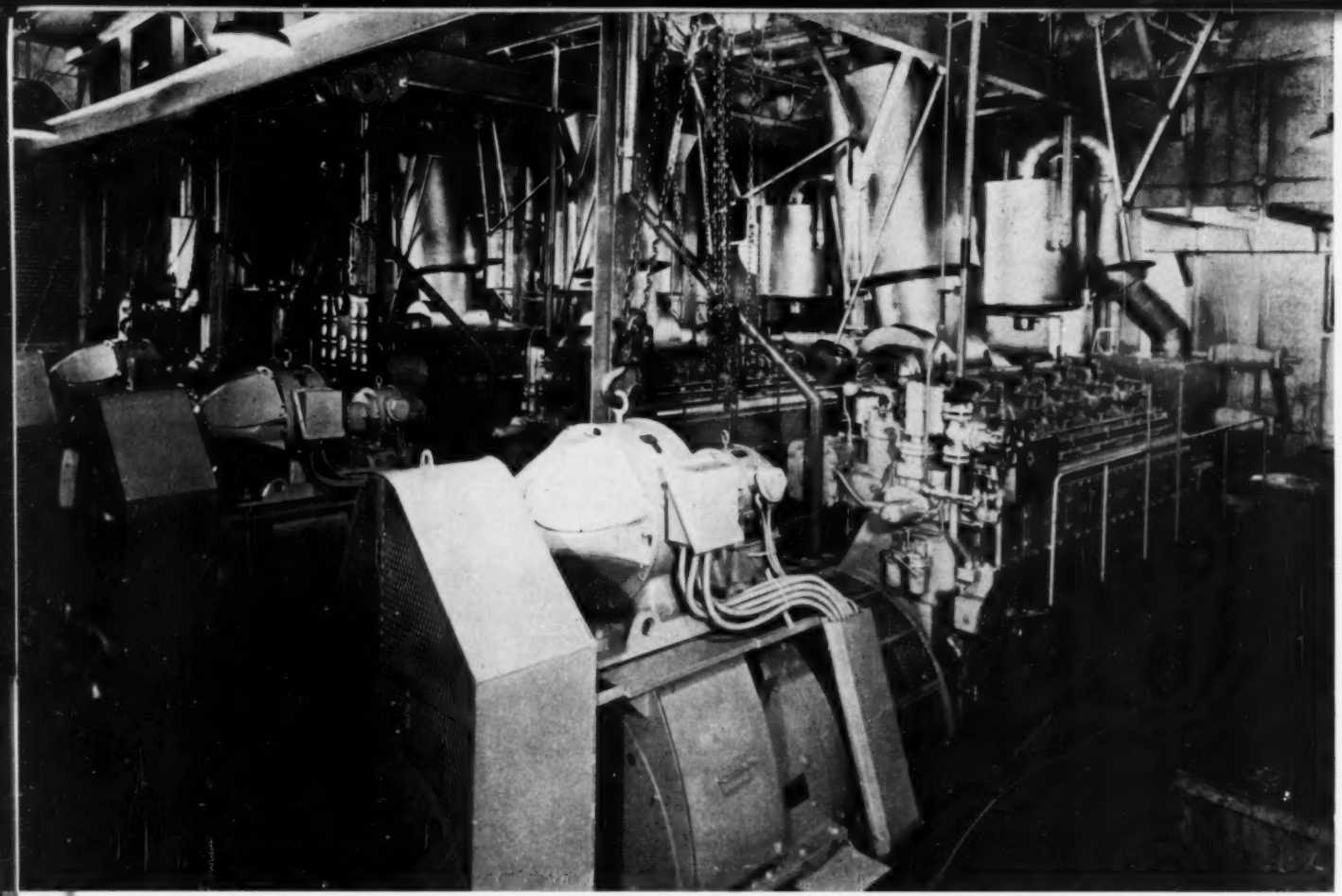
Barge No. 2142 being towed from Avondale Marine Ways, New Orleans, La. where it was built, to Venezuela.



Rigging up barge terminal board with swinging cable between barge and rig.

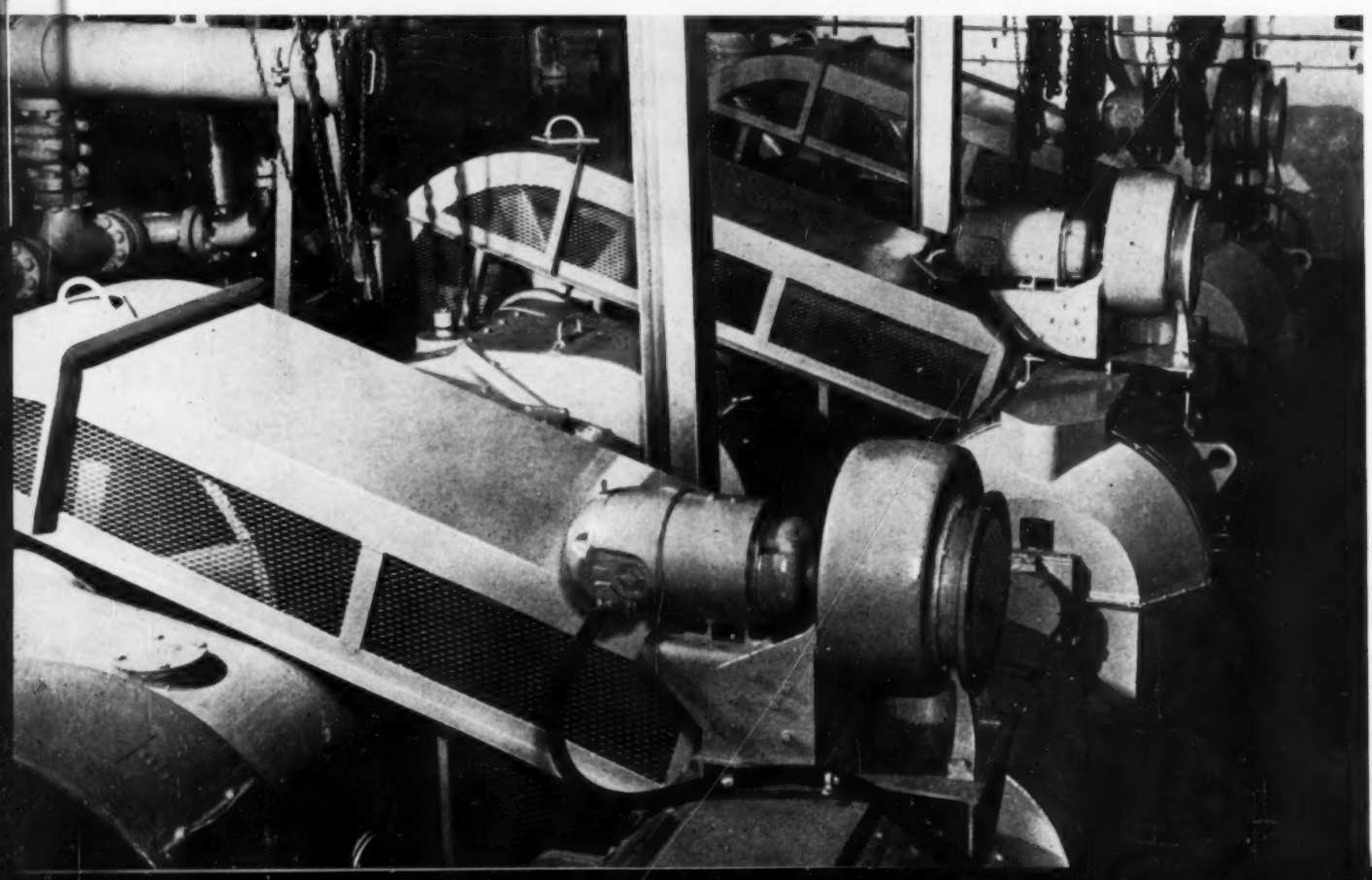
Westinghouse switchboard in engine room showing main and auxiliary control Esterline meters and jumpers.

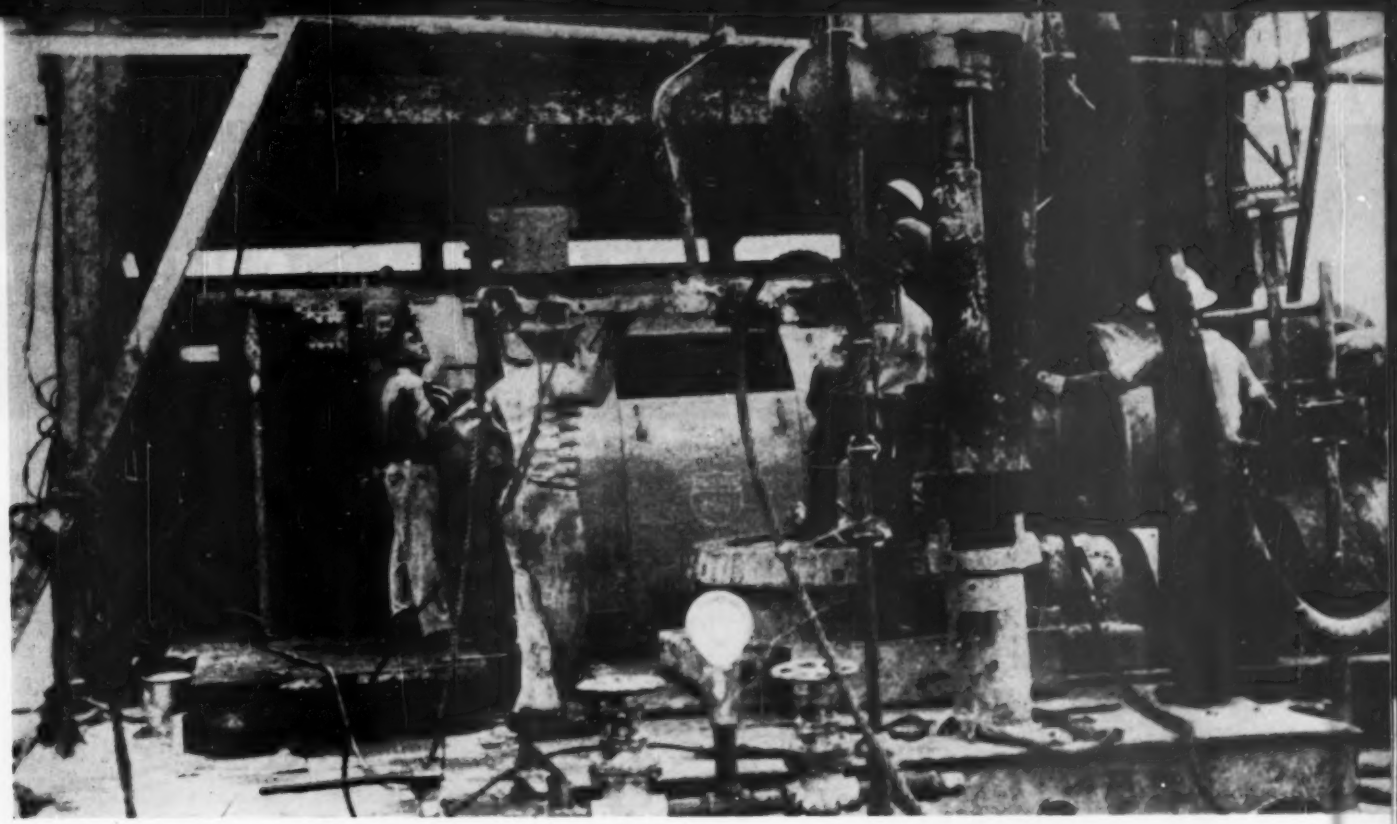




Engine room showing Clark diesel driving units and Westinghouse DC generators. Mounted above each 400 KW generator is a 75 KW generator for lighting and other auxiliary services and a 3 KW exciter for a field of the main generator.

Pump room equipped with three Oilwell mud pumps driven by 500 hp Westinghouse motors. These motors are force-ventilated, explosion-resisting units. Air for motor ventilation may be piped in from a distant location when hazardous gas conditions are encountered. In this room as elsewhere in the barge, overhead rails and hoists are provided to facilitate servicing of individual items of equipment.





Rigging up Tia Juana No. 280, first well to be drilled by the new diesel-electric barge.

has a full complement of ballast tanks, pumps and the like for maintaining trim. Also, during a storm, she can pay out her two bow anchor lines while taking up on the two aft and pull away from the caisson structure a maximum of 30 feet, meanwhile keeping power available to the derrick floor. This is made possible by means of a cable sling which is connected to a hand-winch at the driller's position for taking up or payout of the cable, as required by the position of the barge itself. Thus, not only can the barge pull away from the caissons and prevent damage to both by collision in rough weather, but more important, hoisting operations can be continued as long as necessary to secure the equipment and hole in a safe condition. The question has been asked, what would happen if, in a very severe storm, the power cables were snapped with full power to the derrick floor? The answer is—nothing! That is, nothing would happen electrically to the equipment. It would simply mean a break in the circuit, with the generators rotating at a no-load condition.

Several other factors make the "Queen Mary" a more completely self-contained unit, suitable for remote exploratory wells, the purpose for which she was designed:

(1) Diesel fuel tanks adequate for a 30-day supply.

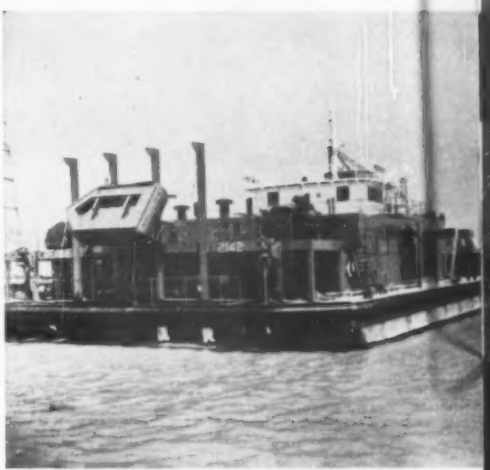
(2) An electrically heated evaporator insures a supply of pure water at all times for engine cooling. This water is perfectly safe for drinking purposes.

(3) A 10-ton Whirley crane, mounted on the top deck overhanging the pipe deck, is used for materials handling. This crane will eliminate the expensive services of a special derrick barge, normally required in lake drilling operations.

Considerable thought on the part of Creole and Westinghouse engineers went into the problem of safety on the "Queen." The main control in the engine room is dead front. Free access to the rear of the panel is prevented by ceiling-high steel mesh with padlocked door. A simple interlock in the mud pump control will prevent the mud pumps from restarting until a roughneck at the pumps operates a reset pushbutton. This feature will protect a man working on the pumps from injury by premature action on the derrick floor. Rubber mats are used wherever practicable. The derrick floor was kept as free as possible of control equipment. All main motors are equipped with blowers driven by Bureau of Mines approved motors.

A novel feature on this drilling rig and power barge is the use of Esterline recording meters, mounted on the main control panel in the engine room. These meters, one for each main motor, make available operating data which will supplement the drilling log with a permanent and graphic record of load versus time. These records should reveal for the first time accurate operating data on pumps and other equipment, so that rods, pistons, liners and valve wear data may be evaluated as to manufacturer, cost and frequency of replacement. Creole petroleum engineers should also find the Esterline meters very useful in making drilling bit and other important studies.

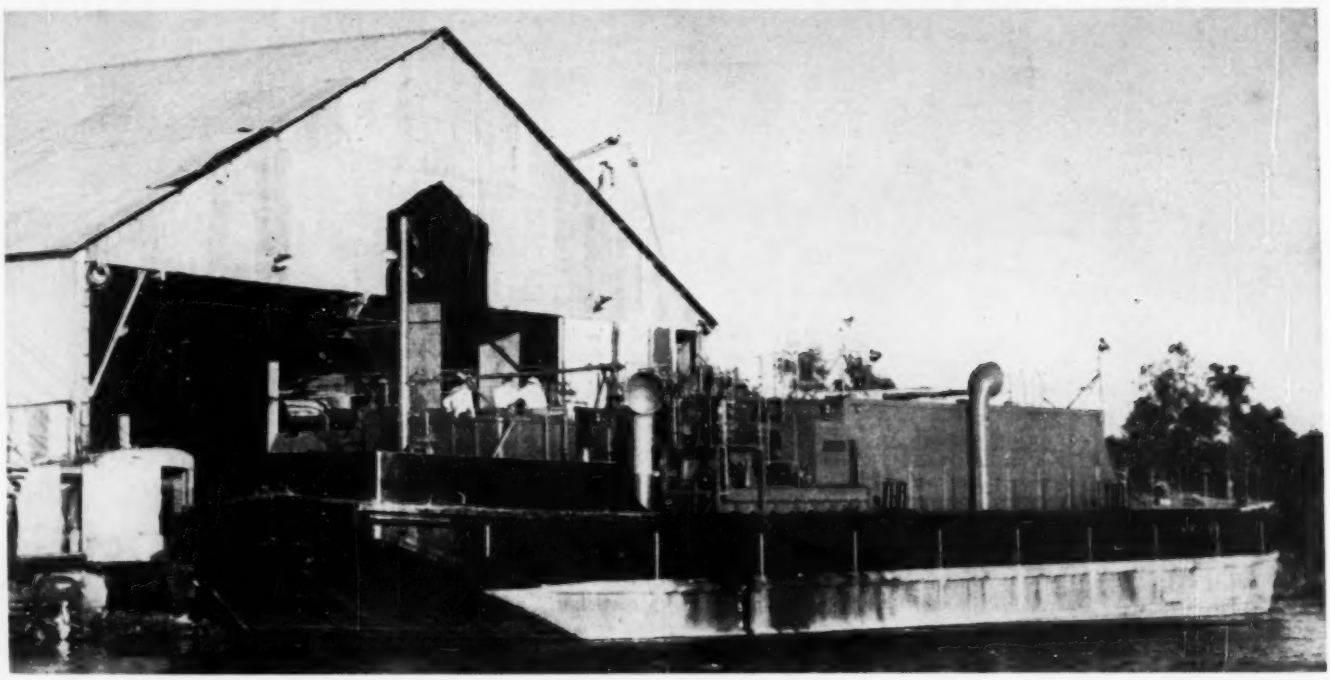
We should expect great things of the "Queen Mary" because of a most promising omen—she struck oil on her maiden voyage!



Rear view of barge showing lifeboat and launching equipment.

Living quarters for supervisory employees aboard Creole No. 2142.

OFF-SHORE CEMENTATION EQUIPMENT



Creole cementing barge nearing completion before being towed from the United States to Venezuela.

By John C. Padgett*

IN the drilling of both exploratory and development wells in the waters of Lake Maracaibo, the Creole Petroleum Corporation has been required to design, develop and employ barges and other marine equipment especially for the purpose of carrying on drilling and cementing operations at well locations several miles from shore.

Until very recently the drilling of wells below 9,000 to 10,000 feet in the deep-water areas of Creole's Lake Maracaibo concessions was not required, and consequently no real heavy-duty barge-mounted equipment has ever been designed or employed for use in this area. However, recent developments and successful application of concrete caisson foundations have indicated the feasibility of drilling to depths in excess of 14,000 feet. In anticipation of these deeper depths, Creole has designed and is planning to use a special diesel electric drilling barge capable of handling power and service requirements for drilling to 15,000 feet. In order to carry on high-pressure cementing and other auxiliary service operations for both the new diesel electric drilling barge as well as other marine drilling operations, Creole has designed and placed in field operation a new type cementing barge for oil well service operations. The new barge, which is somewhat larger than any previously used for marine cementing operations, has an overall length of 109 feet, has a molded beam width of 29 feet and a molded hull depth of 10 feet. The designed mean draft of the vessel, fully loaded with its stationary equipment and a cargo of 6,000 sacks of bulk cement, is seven feet. The calculated total displacement of the vessel is 645 short tons of which 300 is cargo.

The power equipment aboard the barge is designed around the GM-71 series diesel engine group. Diesel engines were selected throughout in order to eliminate potential fire hazards that accompany more volatile fuel. Also exhaust temperatures of the diesel engines usually are lower than the ignition point of a gaseous atmosphere, and in case of emergency, the barge could be brought closer to a wild well or a blow-out without the same hazards that accompany gasoline-powered equipment. Several of the diesel power units are below deck, and although the space is ventilated, it was agreed that the diesel fuel would create the least fire hazard, and with a marine type heat exchanger, the heat would be at a minimum.

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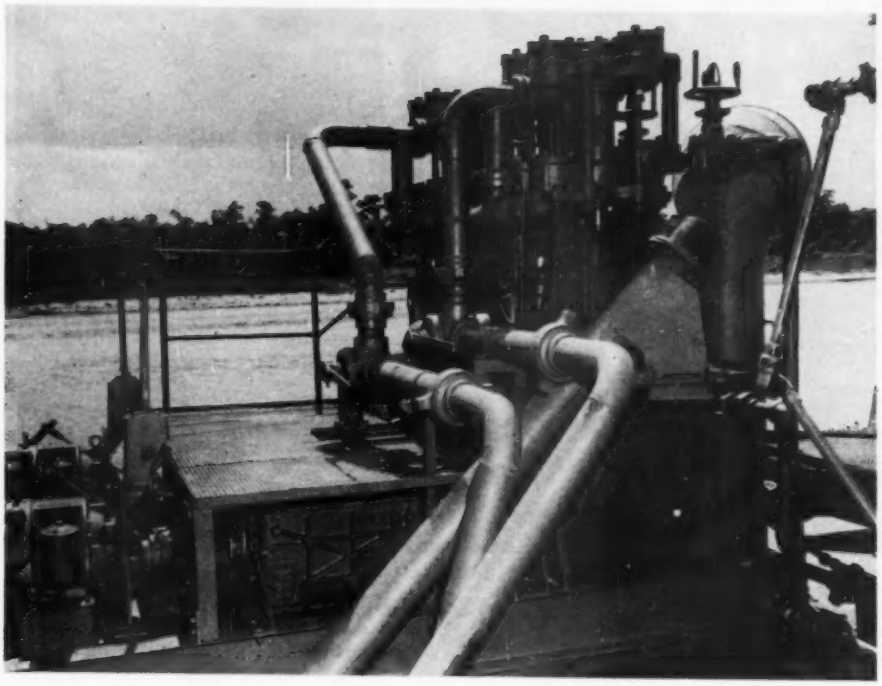
FOR LAKE MARACAIBO



Twin vertical pumps for cementing service. Note transmission and torque converter installation between engine and pump.

In selecting the GM-71 series diesel engines, a lot of flexibility could be obtained in utilizing two, three, four or six cylinder engines in accordance with the power requirements of the various types of equipment. Many of the spare parts for replacement and repair are interchangeable between this group of engines, and in that respect a minimum of spare parts could be pooled together to meet any average breakdown without carrying an excessive replacement stock in ship's stores.

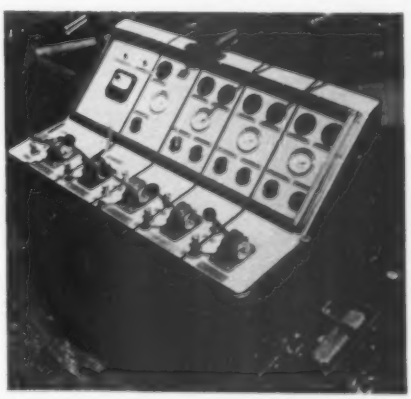
The bulk cement cargo is carried in bins constructed as a part of the vessel. A total of ten bins is used, each having a capacity of approximately 720 cubic feet or sufficient space for 600 sacks (56,400 pounds) of dry cement. In arrangement aboard ship, four of the 600-sack bins are placed ahead of the center watertight bulkhead and six bins are behind the bulkhead. This unsymmetrical arrangement was calculated to offset heavy stationary equipment mounted on the forward deck. Inasmuch as the cargo weight distribution will change and vary as bulk cement is removed from the bins, a ballast tank system has been arranged in the void spaces on the starboard and port sides both forward and aft to provide a means of trimming the keel of the barge to offset unbalanced cargo distribution and to maintain a proper equilibrium of the vessel for towing or for stability during rough or stormy seas.

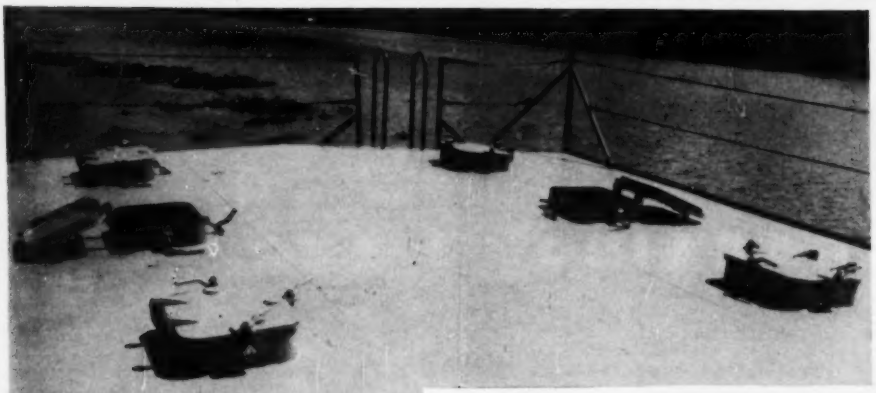
Each bulk cement bin is equipped wth hydraulically operated baffle-plate valves arranged in such a manner that they may be opened or closed to control the rate of flow of the cement for the oil well cementing operations. The bin discharge openings actuated by the baffle-plate valves are connected to horizontal helical screw conveyors which are arranged longitudinally under each bank of bulk cement bins. Two nine-inch diameter screw conveyors transport the dry bulk cement from the bin discharge openings to individual six-inch elevating screws which convey the bulk cement from below deck to the upper deck where it is used for cement mixing and pumping operations.

The nine-inch horizontal screw conveyors are powered from a marine type GM 2-71 diesel with a mechanical drive system and an industrial type master clutch between engine and power take-off. The drive is also equipped with two positive type clutches and arranged to permit either screw conveyor to be engaged selectively. The diesel engine is equipped with a variable speed governor and throttle arrangement with hydraulic pilot control that is operated from the master control station on the main deck. Also a hydraulic control system is attached to the clutches with the master remote control arrangement installed at the master control station. The variable-speed engine is utilized to provide flexibility to the speed of the horizontal screw for adjusting the discharge rate. The horizontal conveyors discharge dry cement from the bins into a six-inch elevating conveyor.

The forward deck is equipped with three high-pressure, 4 x 10 inch vertical pumps driven by individual GM 4-71 diesel engines through Twin Disc torque converters and five-speed heavy duty transmissions. Each of the three pumps is capable of pumping under pressures up to 8,000 pounds per square inch and will handle water, prepared oil well circulating mud or water cementing slurry having weights as high as 17 pounds per gallon (specific gravity 2.04). Piping arrangement from the pumps up through the discharge manifolding system is capable of withstanding pressures up to 12,000 pounds per square inch. All valves, unions and other pipe connections are constructed of heat-treated alloy steel of especially selected quality. A low pressure 4 x 10 inch horizontal service pump driven by a GM 3-71 with four-speed transmission is used to handle mixing water, transfer fluids, etc.

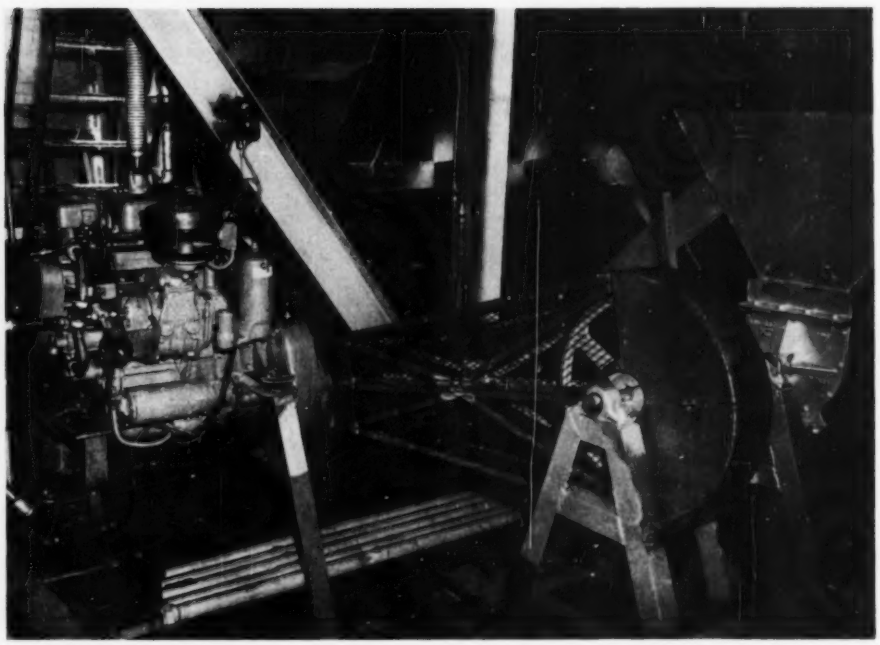
Instrument and control panel for cementing pumps and bulk cement equipment.





Top of bulk cement storage bins showing loading hatches.

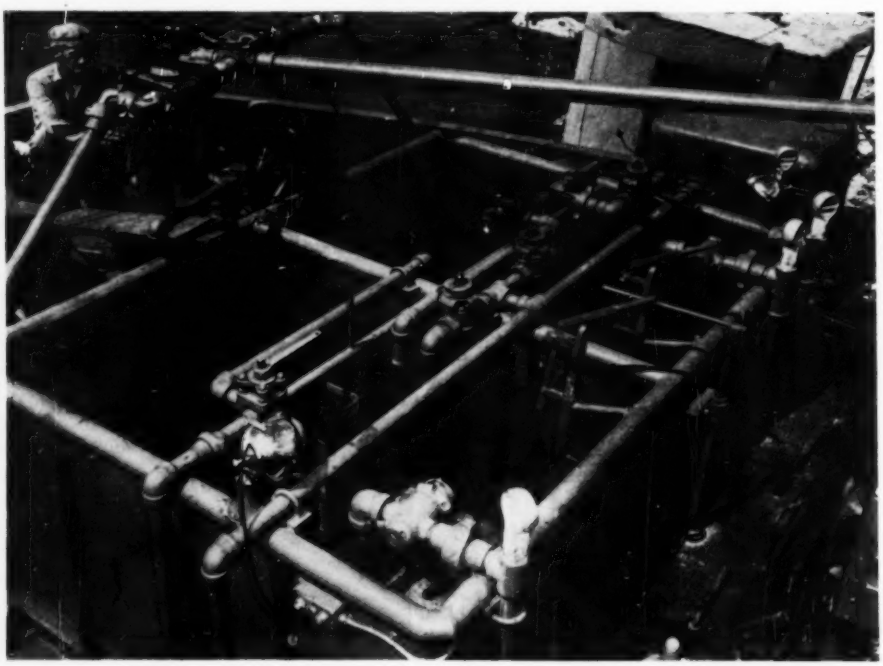
G.M. diesel engine supplying power for bulk cement bin screw conveyors.



A forty-barrel (1,680-gallon) calibrated water tank is manifolded into the low-pressure suction systems of the four pumps. By this means accurate volumetric measurement of water or mud may be used for displacement purposes or cementing service operations.

The water cement mixing apparatus consists essentially of a high pressure jet together with a converted conical hopper whereby dry cement is drawn into the high-pressure water jet stream. The jetted water and cement are discharged from the mixer through a four-inch flow line for the final intimate mix of the cement and water taking place in the turbulent flow of the discharge line.

Calibrated water tank with fill-up suction and release line manifold for water supply and fluid measurements. In background is shown a boom-type main cementing discharge connection.



The high-pressure discharge system of the three vertical pumps is manifolded into a single discharge line mounted on a swivel and handled by a small hand winch. The length of the discharge line is such that it may be attached to permanent drilling rig connections without the use of additional piping.

Other auxiliary equipment on board the barge is as follows: 20 KW GM 2-71 diesel electric generating set is used to supply AC power to deck lights, air compressors, battery chargers, ventilating fans, hydraulic pumps, emergency bilge and fire pump, with a sufficient reserve of power available for future installation of radio communications.

A special two-drum gear-driven winch, powered by a GM 2-71 diesel engine, is mounted on the stem to handle the 3,000-pound anchors. One anchor is mounted on the stern and is attached to the winch by means of a one-inch cable with a drum capacity of 1,000 feet. The second anchor is mounted in the stem and is attached to the second drum on the winch by means of a one-inch cable which runs lengthwise of the vessel through fairleaders and gimbals.

PRESIDENT BRINGS TIDELANDS ISSUE TO FORE

By Joseph Huttlinger

Washington

TWO dramatic moves were made last month by President Harry S. Truman in furtherance of the administration's campaign to substitute federal for state ownership of submerged lands around the country's maritime borders.

In the first of these, through Attorney General Tom C. Clark, the President asked the Supreme Court to decide that the lands offshore Texas and Louisiana with their estimated $30 billion worth of oil belong to the federal government and not to those states. The two briefs recalled that the high tribunal had ruled on June 23, 1947, that the federal government has "paramount rights" in the undersea lands off the coast of California and asserted that the same conditions apply to the two Gulf states.

Two weeks later the President went to Congress to deliver his annual State of the Union message. In a passage to which he gave solemn emphasis, he said: "We must adopt a program for the planned use of the petroleum reserves under the sea which are—and must remain—vested in the federal government."

At the words, there were cheers from a few ardent supporters of the administration in House and Senate, but the bulk of the congressmen remained silent.

In a third action, the President directed aides of the Interior and Justice Departments to rewrite the administration bill of last year providing the rules under which the federal government would lease offshore lands to oil companies. Only minor changes were anticipated, but nothing is certain until the matter is placed publicly before Congress. Senator Joseph C. O'Mahoney (Dem., Wyo.), chairman of the Senate Committee on Interior and Insular Affairs, prepared to receive this administration proposal in his committee.

The bill of last year, introduced by Senator Alben Barkley, of Kentucky, now Vice President, provided that oil companies holding state leases should get first chance at new leases under the federal operation; it directed that 37½ percent of any income derived from offshore wells should go to the state, 10 percent to the federal government, and 52½ percent to the reclamation fund.

With the filing of the court actions, officials of Texas and Louisiana issued angry charges that the federal government was trying to take away property rightfully belonging to the states. Virtually every congressman from the states involved joined in the chorus, and even Senator Tom Connally (Dem., Tex.), general and administration supporter, attacked the action.

Attorney General Price Daniel, of Texas, said the move is "a violation of the annexation agreement by which Texas entered the Union. We are prepared to defend the Texas title and will fight this case with the same spirit that caused our predecessors to win these lands by blood and valor at San Jacinto," he said.

State officials then set to work on two problems: to prepare replies to the government complaints, and to line up sppport in Congress for legislation quitclaiming rights of the federal government to the tidelands. Active in the work is the National Association of Attorneys General. At a meeting Jan. 14 in Washington the association's submerged lands committee agreed to push for action on a state control measure identical to that which passed the House 259 to 27 in the last Congress.

Official replies from Texas and Louisiana to the suits against them came Jan. 17 in separate motions to the high tribunal asking a denial of the government request. Texas said the matter is up to Congress and not the courts. It asserted the government has no right to sue Texas. It insisted that when Texas entered the Union, it "retained all property within its boundaries not specifically conveyed to the United States." But if the high tribunal does not think all this reason enough to throw out the government request, the brief went on, it should let the lower courts handle it. In a district court the witnesses and evidence can be obtained more easily, the motion said, and unlike California, Texas will want "to develop the evidence fully."

The Louisiana motion was longer. It asserted the state has never consented to be sued. It added that the suit would interfere with Louisiana's handling of its own affairs, upset the balance of dual government, be incompatible with sovereign rights and the Constitutional plan and cast shadows over the sovereignity of other states.

On other major tidelands developments, two oil men said that the ownership of tidelands is not of basic importance to the industry. But the National Petroleum Council came out strongly in its policy report in favor of state control.

The significant part of the new action against Texas and Louisiana is that it indicates the purpose of the federal government to cancel out all oil and gas leases signed since the California decision a year and a half ago. The retroactive feature is seen in the last paragraphs of the complaints, which are virtually identical, reading:

"The state has frequently and publicly denied the rights and powers of the United States in the area herein described and has claimed full and complete ownership of the area for itself and, unless the rights of the United States are established and declared by this court, the state will continue to claim such ownership for itself and to exercise the rights incident to such ownership through its officers, agents and employees, and will continue to aid, abet and encourage others, as its lessees, to trespass upon and to take and use the minerals and other things of value in the area, in violation of the rights of the United States, from which the United States will suffer irreparable injury and for which it has no adequate remedy except by this action.

"Whereof, plaintiff prays that a decree be entered adjudging and declaring the rights of the United States as against the State of Texas (Louisiana) to account to the United States for all sums of money derived by it from the area herein described subsequent to June 23, 1947." The complaints were signed by Tom C. Clark, Attorney General, and Philip B. Perlman, Solicitor General.

The papers filed against Texas and Louisiana were brief, consisting of seven pages in two parts, and were virtually the same in wording and intent. They included a motion to file a complaint against each state and a copy of the complaint. In the Louisiana case, the area in dispute covers undersea lands extending out 27 marine miles; in the Texas case it includes the lands out to the edge of the continental shelf. The variation in wording is due to the difference in the claims of the two states as to adjoining submerged lands. The allegations relating to Texas read as follows:

"At all times herein material, plaintiff was and now is the owner in fee simple of, or possessed of paramount rights in, and full dominion and power over, the lands, minerals and other things underlying the Gulf of Mexico, lying seaward of the ordinary low-water mark on the coast of Texas and outside of the inland waters, extending seaward to the outer edge of the continental shelf and bounded on the east and southwest, respectively, by the eastern boundary of the State of Texas and the boundary between the United States and Mexico."

The assertion that the proposed action violates the treaty by which Texas entered the Union is answered in the document: "The circumstances under which the State of Texas entered the Union are in certain respects different from those under which the State of California was admitted; but to the extent that any of those differences are relevant at all, they point even more clearly to paramount rights in the United States."

The brief gave the government's reasons as to why the high tribunal should take over at once without awaiting action in lower courts.

"It is reported," the government said, "that certain leases covering lands underlying the Gulf of Mexico have been entered into by the State of Texas and its lessees subsequent to June 23, 1947, the date of the decision of this court in the California case. Officials of the State of Texas have openly stated that they do not regard the rule announced in the California case as applicable to the lands underlying the Gulf of Mexico adjacent to Texas and that they contemplate a continuation of the various activities of the state in connection with the development of oil and gas in those lands, in violation of the rights of the United States.

"Accordingly it is believed that the rights of the United States can be protected only by a decress of this court granting the relief prayed for in the complaint. It is respectfully submitted that the motion for leave to file the complaint should be granted."

It is significant that the administration has moved from the defensive position which it took last year when a bill to quitclaim to the states title to the submerged lands passed the House by a tremendous majority and was stopped in the Senate only by delaying tactics in committee. It is one of several indications of the President's conviction that the present Congress will accept his recommendations on legislative matters.

Congress itself is alive to the issue, for at this writing about 20 tidelands bills have been introduced. The bulk of them call for the recognition of state title. A rocky road lies ahead for any legislation on tidelands, however. In fact, more than a few members of Congress foresee a stalemate on any legislation on the subject. Neither the state title measures nor the federal control measures can pass Congress in their present form, according to a substantial body of thinking in Congress.

This is not to say there will be want of pressure for passage of legislation. On the contrary, the forces are lining up for what is certain to be a spirited battle. In one respect, however, the administration undoubtedly has gained ground as a result of the recent election. That is in the veto power held by the President. If, for instance, a state control bill were passed, as once happened, it would run into a certain veto from the White House. To override this would require a two-thirds vote of each chamber. Not a handful of Congressmen can be found to forecast sufficient votes to override.

As for a federal title measure, its chances are considered doubtful. When state title is at stake, a multitude of persons over the country are involved in many ways, and the Congress is the representative of these. One suggestion that has been put forward is a compromise of some sort. Just what it could be is hard to detemine. Senator Kerr, of Oklahoma, who is at once an administration supporter and an oil man with drilling operations in the Gulf of Mexico, has tentatively broached the idea that title to submerged lands might be left to the states with federal government exercising broad regulatory powers. This is unlikely to satisfy either side. While oil is directly involved, the fundamental issue is a very broad one. Under the doctrine of paramount right laid down by the Supreme Court in the California case, the federal government could take away any property of the states in any part of the country, and this condition might lead to opposition in sections of the country not engaged in oil production.

For the states that have been in court actions, an important financial stake is involved as well as the principle of states' rights. The ultimate value of oil in the submerged areas is impossible to calculate. One figure used is $30 billion, or about 11 billion barrels. Potential oil-bearing lands in the Gulf are estimated at 100,000 square miles of area. More than $20 million in bonuses has been paid to the State of Louisiana for leases on two million acres of offshore lands. Another $7 million in bonuses has been paid to Texas. Oil companies are spending fantastic sums in the hunt for oil in the undersea lands, and they are worried about the validity of their leases as the battle of ownership goes on.

Outside the companies with direct investments affected, sentiment in the industry is strongly in favor of state rather than national domination of offshore areas. This is because oil men generally are against federal control on the basis of past experience and because they feel that development of submarine areas would be more rapid and efficient under the system of handling worked out by the oil-producing states on the basis of past experience. Thus, Chairman Jacobsen of the National Petroleum Council said in a personal interview that ownership of tidelands oil is "not a question of basic importance to the industry. The important thing is to get tidelands oil developed," Mr. Jacobsen said. "In the event of a war, it is no good to wave your hand over the Gulf of Mexico and say we have billions of barrels of oil out there. I do believe there is more chance it will be developed if it remains under state control."

In its long-debated report entitled, "National Oil Policy for the United States," the Council explicity stated his views on tidelands. Inasmuch as its words were weighed carefully and for months before being incorporated into the report, and because this is an "historic document" for the industry, the tidelands section is given in full:

"The petroleum resources of the lands beneath the marginal seas extending to the outer edge of the continental shelf can best be explored and developed under state rather than federal control. Substantial quantities of oil lie under the seas bordering the shores of several states. They constitute one of the most important sources of additional domestic oil supply remaining to be discovered and developed. A prudent oil policy would require that these resources be discovered and developed as soon as possible.

"Years of experience have demonstrated that state laws and regulations, designed to provide the necessary incentives and proper conservation practices, and on-the-ground state administration encourage the risk-taking vital to the discovery and development of petroleum resources. Federal laws and regulations, with final authority far removed from the scene of operations, have tended to discourage exploration for oil underlying federal lands and to retard its discovery.

"Furthermore, on historic and constitutional grounds and under judicial precedents, the abutting states should own the lands and the resources beneath the marginal set to the outer edge of the continental shelf inasmuch as any area within or appurtenant to the continental United States is required, under our federal system, to be included in one or more states of the Union. A sound national policy should prompt Congress to confirm in such abutting states the ownership of the lands and subsoil beneath such marginal seas."

N P C OUTLINES NATIONAL OIL POLICY

RESPONDING to a request of the Secretary of the Interior, the National Petroleum Council, made up of representatives of all branches of the oil industry, has drawn up a report defining the principles on which a national policy should be based and suggesting briefly how these principles can be applied effectively. In very condensed form here are the Council's conclusions as to the objectives of a national oil policy:
(1) It should result in a maximum contribution by the oil industry to an expanding American economy and to a rising standard of living, including stable employment at fair wages within the industry.
(2) It should maintain conditions most likely to assure adequate supplies of petroleum in both peace and war.
(3) It should maintain conditions, within the free enterprise system, most likely to assure adequate supplies of essential materials equitably available to all units in the industry in both peace and war.
(4) It should contribute to the expansion of trade and of industrial activity at home and abroad by encouraging American nationals in the development of both domestic and foreign oil resources.
(5) It should operate to strengthen our free institutions by demonstrating that issues involving the relations of government and private industry, of state and individual, can be successfully resolved within our existing institutional framework.

The following general principles are fundamental to a sound national oil policy.

(1) National security and welfare require a healthy domestic oil industry. Continuing supply to meet national oil needs depends primarily on availability from domestic sources. Due consideration should be given to the development of foreign oil resources, but the paramount objective should be to maintain conditions best suited to a healthy domestic industry which is essential to national security and welfare. To this end, adequate and equitable availability of essential materials is a fundamental requisite.

(2) The public interest can best be served by a vigorous competitive oil industry operating under the incentives of private enterprise. The competitive form of economic organization, by offering the promise of reward commensurate with contribution and efficiency, utilizes a motivating force for which no adequate substitute has been found. Other nations have tried other methods, but it is the American oil industry operating under the American system which sets the highest standards of achievement and service.

(3) The appropriate functions of federal and state government in relation to the industry and the principles underlying their present relationships should be maintained. In the exercise of their powers a clear line of demarcation should continue to exist between federal and state governments. The operation of the American petroleum industry is grounded on state regulations of oil and gas production in the interest of conservation. State regulation under our constitutional system evolved as the legal and most effective answer to the problem of a widely dispersed natural resource. State authorities have proved effective in their protection of the public welfare, and the decentralized approach has been highly successful in meeting the wide variety of conditions that prevail in different areas.

(4) No government actions specifically affecting the oil industry should be taken without proper regard for the long-term effect and without consultation with the industry. As long as a free market prevails, price functions effectively as a regulator of supply and demand and as an allocator of supply to the channels of greatest need. It also provides the necessary incentives for exploration, increased efficiency and technological improvement and permits the capital formation necessary to continued progress.

The natural petroleum potentialities of the United States are very large, and oil exists outside the United States in great abundance. When conditions justify, these natural supplies can be supplemented by the vast resources available through synthesis of coal, shale and natural gas. There will be liquid fuels enough for many generations to come. The promotion of new discoveries, therefore, must be the primary consideration of national policy. This involves continuing encouragement of private exploration efforts at home and abroad, so that ample sources of oil will be under development at all times for peace or emergency needs.

Over the past twenty years the industry has developed engineering methods designed to eliminate waste and to increase the recovery from oil fields. This procedure is based on the discovery that the total recovery is greatly augmented when the flow from oil wells is not permitted to exceed maximum efficient rates. Most of the information on which maximum efficient rates are determined has been developed through industry research on the nature of oil-bearing structures and underground movements of oil.

In oil fields in which more than one operator have interests and where unit operation would result in greater ultimate recovery, appropriate action should be taken by the states to encourage such operations.

The industry has developed scientific and economic methods of secondary recovery which provide the means of adding vast quantities of oil to our recoverable reserves. Continued research and improvement in techniques are desirable.

Technology is a creative force of major importance in expanding our petroleum resources and in providing adequate supplies of oil at reasonable prices. The competitive conditions under which the industry's great technological advances have been made should be maintained. The economic and efficient development of synthetic fuels to supplement natural petroleum as needed can best be achieved by private industry.

Oil and gas are only a part of our nation's energy resources. All these resources combined are adequate to meet energy needs; the relative use of each will be determined most effectively by the operation of price in a free market. Provisions in tax laws which have long recognized the requirements of petroleum operations are essential to the continued development of our oil resources and, in furtherance of the public interest, should be maintained.

The petroleum resources of the lands beneath the marginal seas extending to the outer edge of the continental shelf can best be explored and developed under state, rather than federal, control. Continued industry efforts to find and develop oil and gas on federal public lands should be encouraged.

Conditions should be maintained under which the industry may continue to form the capital required to expand its operations to meet the nation's growing needs for petroleum.

Efficient marketing of oil and oil products is a major responsibility of the industry. It should continue to support and encourage a system of distribution under which thousands of independent marketers, integrated companies and others compete to bring the industry's products to the consumer. The oil industry is opposed to monopoly and believes that competition contributes to the public good.

State and federal laws should encourage, not impede, the development of natural gas resources by industry. The proper sphere of regulation by federal agencies is interstate commerce. It is not the function of the federal government to control the end use of gas any more than it is its function to control the end use of coal, crude oil, cotton, wheat or other commodities. The Constitution does not confer upon the Congress the power to control end use, and the exercise of such authority would be contrary to American principles.

Participation of the United States nationals in the development of world oil resources is in the interest of all nations and essential to our national security. Conditions should be fostered that will further this participation but not to the extent that this involves preferrential treatment of operations abroad at the expense of the domestic industry. An effective oil policy should encourage access by our nationals to world oil resources on equal terms with other nationals, and stable agreements between foreign governments and private industry on a basis which will promote development by free enterprise methods. The federal government should encourage foreign oil development by American nationals by efforts directed through diplomatic channels to reduce political risks involved in such foreign operations and by permitting United States citizens to operate abroad in conformity with the laws and customs of other countries.

The nation's economic welfare and security require a policy on petroleum imports which will encourage exploration and development efforts in the domestic industry and which will make available a maximum supply of domestic oil to meet the needs of this nation.

The maintenance of a vigorous oil industry in time of peace is the best way to assure the reserves and facilities needed in time of war. Withholding from development the oil on public lands or in offshore areas with the thought that it can be used in an emergency is not sound policy in terms of national security. This oil can be made fully available only by continuous and prolonged peacetime development.

Procedures for government-industry consultation should be maintained on a permanent basis so that plans to meet emergencies can be adjusted continually to changing conditions.

The American oil industry is distinctively a product of the American way of life. For many years it has operated under one of the most effective and efficient industrial policies in our economy.

The industry will continue to produce the optimum economic and social gains inherent in the nation's petroleum resources, granted the conditions of a free economy and recognition of the economic laws which direct its operations.

If, in addition, the United States government through diplomatic efforts is able to reduce the political risks inherent in foreign operations, American nationals with their capital, managerial skill and technical knowledge can be counted on for increasingly important contributions to world recovery and peace.

Vigorous oil development under competitive conditions at home and abroad is the best way to assure our national security.

MEXICO PLANS RECORD EXPENDITURE FOR OIL INDUSTRY DEVELOPMENT

By Douglas Grahame

Mexico City

BACKED apparently by confidence in favorable action by Washington on the proposed series of loans from the United States aggregating some $470,000,000, Petroleos Mexicanos has proposed the greatest expansion of oil development in its history for the coming year. Its 1949 budget, approved at a board meeting presided over by Lic. Antonio Martinez Baez, Secretary of National Economy, is 1,100 million pesos (approximately $220 million) as compared with 958 million ($192 million) last year, 791 million ($158 million) in 1947 and 568 million ($114 million) in 1946.

Pemex estimates its 1949 income at 1,091,364,000 pesos, ($218,275 million,) a gain of 15 percent over last year. Of this 82 percent is expected to come from domestic sales and the remainder from exports. Revenues for 1948 are figured at 950,459,117 pesos, compared with 791,480,714 in 1947 and 568,003,720 in 1946. Consumption of oil in 1948 is estimated at 50.5 million barrels an increase of 34 percent over 1945.

Senator Antonio J. Bermudez, Pemex managing director, took an optimistic viewpoint in broadly outlining the company's outlook in 1949 and reviewing its accomplishments in 1948. He stressed an estimated production of 60 million barrels of crude in 1948, an increase of some seven million over the 1947 output, as auguring well for the future. Calling oil "the first industry of the country," (mining has long been regarded as Mexico's No. 1 business,) Bermudez announced that Pemex had paid the Mexican government 320 million pesos in taxes during 1948 and expects to increase this to 365 million in 1949.

Drilling in 1948 totaled 102 wells, largest since 1934 (before expropriation) when 137 wells were drilled. Pemex now has 60 drilling outfits, and as many more will be acquired and put into service in new areas.

Senator Bermudez spoke enthusiastically of the recently discovered Reynosa field in Tamaulipas on the eastern Texas border. Seven wells have been brought in there. Average daily production is 2,000 barrels. At present 14 seismic crews are working in Mexico. Two of these are operated by Pemex and the others have been supplied by American companies. There are four gravity meter crews in the field and 13 geological parties at work.

In northern Mexico four seismic crews, two geological parties and one gravity crew are operating out of Monterrey. In the coastal region centering at Tampico three groups of geologists, five seismic parties, a gravity crew and an electric crew are working. From Puerto Mexico exploratory work in the southern region and in Yucatan is being done by six geological crews, three seismic crews and two gravity crews. A limited amount of work is being done in the region of Cordoba, southeast of Mexico City, by two seismic parties and one geological group.

Considering Mexico as an extension of the prolific producing areas in Louisiana and Texas, it is not doubted that an all-out exploration program will bring in very large quantities of oil. Texas producing formations, such as those in the Permian basin, may be found over a very large area in northern Mexico. The Tampico area already has produced tremendous quantities of oil and may be expected to provide new fields, including some on the continental shelf. The isthmus of Tehuantepec with its salt domes is similar in possibilities for production to part of the United States Gulf coastal area.

While Pemex has not yet announced its well drilling program for 1949, it is learned that this work will start with at least 32 wells in the famed Cerro Azul fields, Vera Cruz, site of the great producer, Cerro Azul No. 4. Exploration will be particularly pushed in Chihuahua where Pemex has high hopes of developing an important field at El Cado, and also in Tabasco, Guerrero and Oaxaca.

Work was started on the oil line from Pemex's refinery at Minatitlan, Vera Cruz, across the isthmus of Tehuantepec to Salina Cruz, Oaxaca, on the Pacific coast, southwestern Mexico's principal port, Senator Bermudez announced. This line will greatly reduce costs of servicing the Pacific seaboard by eliminating the present tankering from the Gulf through the Panama Canal, or by rail to Manzanillo. It is expected that this pipeline will be finished in 1949.

Construction is well advanced on the refinery at Salamanca, Guanajuato, which will service a wide sector of north central and far western Mexico. Pemex is endeavoring to complete this job in October. The refinery will receive crude from Poza Rica by an extension of the Poza Rica-Mexico City oil line. This extension is using material and pipe made in Mexico by Altos Hornos de Mexico, S.A., a large iron and steel works at Monclova, Coahuila, that was started by private enterprise but is now government-operated by the Nacional Financiera, S. A., the government's fiscal agency.

The line to supply the Federal District (Mexico City,) with natural gas from the Poza Rica fields, Vera Cruz, is 85 percent completed, and it is hoped that it will be ready for official inauguration on March 18, the eleventh anniversary of expropriation. This gas line is using 28,000 tons of 20-inch pipe, and it is being built entirely from Pemex's own resources.

In a full-page advertisement recently published in leading Mexican newspapers, Pemex declared that it is not "a profit-making enterprise but an industrial organism owned by the nation, at the service of the interests of Mexico, that follows a policy of low prices, which in that aspect differs from the norms that govern private companies." It detailed that it annually supplies the National Railways (Government-administered) 1,590,000 liters of fuel oil at 0.029245 pesos per liter at Tampico, which is lower than production costs, and yields a yearly total of 46,500,000 pesos. It supplies yearly other industries in Mexico 2,226,000,000 liters of fuel at 0.04623 pesos per liter in Tampico, with an annual revenue of 102,900,000 pesos, or a grand yearly total of 149,400,000 pesos from these two groups of customers. Were it sold at prices charged by refineries in Texas and Louisiana for this kind of oil at the rate of $2.46 or 16,974 pesos per barrel, equal to 0.10675 pesos per liter, it would cost the railways for the annual 1,590,000 liters 169,740,000 pesos, and it would cost the other industries 237,636,000 pesos for their yearly 2,226,000,000 liters, or a grand annual total of 407,376,000 pesos.

The advertisement also said that the Mexican public consumes 1,500,000,000 liters of gasoline yearly at an average price of 0.30 pesos per liter, an annual total of 450,000,000 pesos, which compares with an average of 0.48 pesos per liter in the United States, representing a yearly saving to these users of 163,500,000 pesos, all adding up to the fact that "Pemex, instead of being a burden to the country, contributed in 1948 to the economic benefit of the nation, from the three mentioned products alone, the sum of 734,476,000 pesos."

Although Senator Bermudez declared that relations between Pemex and its workers are most cordial, Eulalio N. Ibañez, secretary general of the oil workers' union, has announced that at the end of March he will demand revision of the collective work contract for 9,000 artisans that expires May 30. The goal is a reduction in the work week from 44 to 40 hours and a pay increase of 45 percent.

Oil is one of the decisive factors in 1949 for the "betterment and solidarity of Mexican economy," said President Miguel Aleman in an

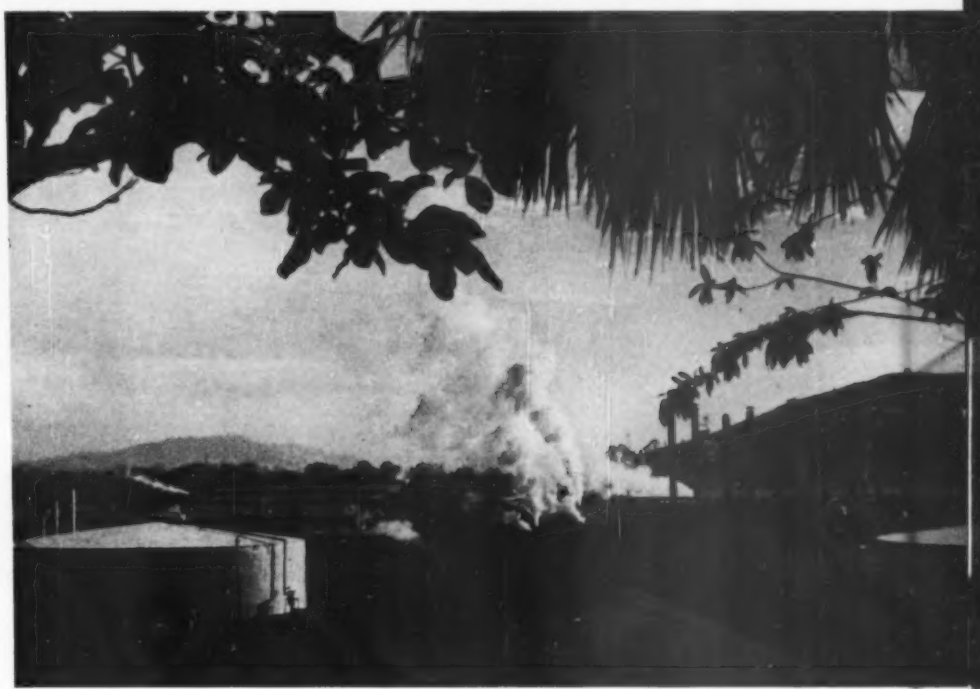
interview with a leading Mexican newspaper. He asserted that he has full faith in the future of the Mexican oil industry, adding that though the world picture is much upset and confused, "Mexico will continue progressing, and the censure of the always discontented is unimportant and the systematic criticism of everything the administration does must not be taken seriously, for while there is discontent and gossip in the capital, the rest of the country is hard at work."

The Wolverton committee's recommendation has dramatized the oil picture for Mexicans more fully than any other development since expropriation. While local opinion, for the most part, sees materialization of the recommendation as a great benefit to Mexico by strengthening its oil industry, the communistic element frowns on it. "El Popular," definitely leftist Mexico City daily, in front-page headlines said of the recommendation, "On very dubious terms they want to help us produce more oil. Lack of confidence toward our country is demonstrated in urging Yankee intervention in the application of this loan." Later, the same publication carried the report of Secretary of Commerce Charles Sawyer's New Year statement under the banner, "A complete uncertainty exists about the future of Yankee economy, says the Secretary of Commerce."

Publication by a New York financial journal of an article on the Wolverton recommendation prompted a statement by Senator Bermudez, which said in part: "Changing the oil law or the present petroleum policy has never been thought of. If some contract is made with foreign individuals or companies, logically that must be strictly within the law. We do not take into account what 'The Wall Street Journal' said, nor are we in accord with that opinion. Fortunately the Commerce Committee of the United States Congress is not a dependency of the Wall Street sector."

Legal opinion seems to be that, as the Mexican oil law and petroleum policy now stand, foreign participation in the oil business, either by individuals or by companies, can only be in exploration and not in exploitation of any kind.

General view of Poza Rica Refinery.



UNCERTAIN OUTLOOK FOR MEXICAN LOAN

Washington

RECOMMENDATIONS that the United States provide Mexico with a series of loans aggregating close to half a billion dollars for the expansion of that country's oil industry and a request that the State Department endeavor to make arrangements for the participation of United States companies in this development formed the highlight of the final report, filed by Representative Wolverton of the House Commerce Committee, as a result of the investigation under his chairmanship into fuel requirements of the United States. There is considerable uncertainty as to the future of this proposal, however, because of the fact that both the committee and the State Deparment are under new direction and because there are signs of mounting opposition to the plan.

Tentative proposals are for the following advances: $130,000,000 for geophysical surveys and exploratory drilling; $240,000,000 for field development; $46,000,000 for pipelines, and $32,000,000 for refinery construction, a total of $470,000,000. The work would extend over a five-year period and is estimated to require 525,000 tons of steel.

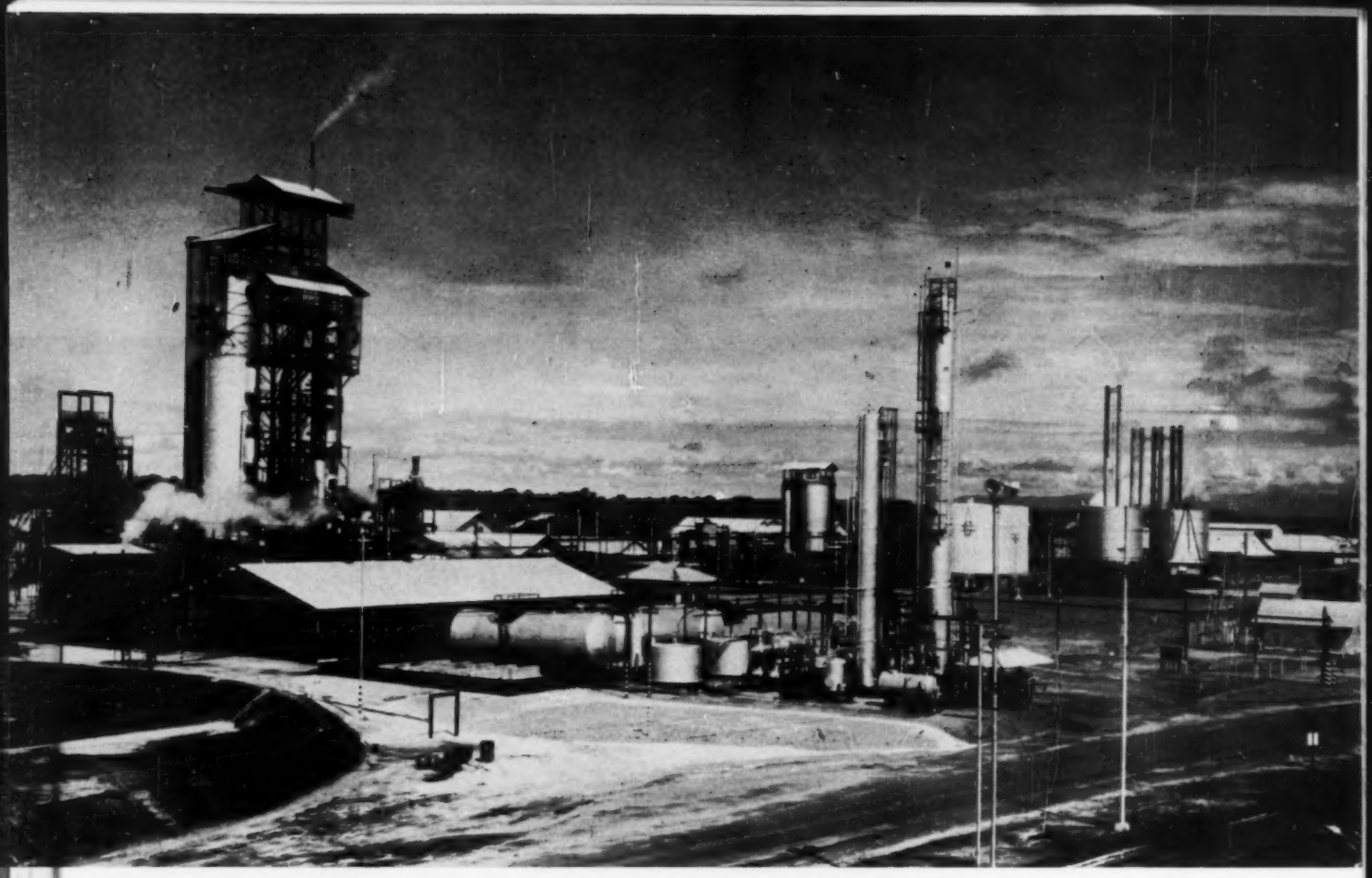
Committee interest in the loan project was based on the assumption that domestic production could no longer satisfy the growing requirements of consumption and that the United States must enlarge its imports from year to year. Aside from this consideration, military strategists insist that in the interest of national security the country should have a reserve of potential production amounting to at least a million barrels daily, so located that it could not be cut off in time of war. Since Mexico is directly adjacent to the United States, supplies could move by pipeline across the border, and it was felt that reserves developed there would be safely available in an emergency.

In the past year, however, the domestic oil industry has demonstrated its ability to find greater quantities of oil, and producers, especially those in the southwest, are increasingly concerned with proposals to expand imports from whatever quarter they may come. They argue that loans based upon oil as security would carry an obligation to accept whatever surplus might be available from the producing country that allocations to reserves would be at the expense of the domestic industry.

Mexican law and settled policy forbid the granting of control over mineral rights to foreigners. While the Aleman administration undoubtedly is sincere in its desire to enlist outside capital in developing oil resources, the terms offered thus far are hardly attractive to investors. While some of the larger refining companies in the United States might be interested in obtaining additional sources of crude supply, the conditions that have been offered heretofore would make them merely agents of the Mexican oil authorities in exploration and drilling, with no control of the oil after it leaves the well.

With the opposition of independent producers and the indifference of the major refiners, the ultimate fate of the loan appears to depend upon the degree of interest the State Department takes in the proposal.

Most recent proposal for exploration and drilling by foreign oil companies in Mexico is said to contemplate a return to the companies of fifty percent of the value of oil produced until actual costs of exploration and drilling have been retired. No deduction would be made for lease-operating expenses before payment. In addition the foreign companies would receive 13.5 percent of the gross production or its value as compensation for the risks involved and for management.



Tropical Oil Co. refinery at Barranca-Bermeja which reverts to the Colombian government in August, 1951. Photo by Collier for Standard Oil Co. (N.J.)

COLOMBIA ENACTS LAW FOR DE MARES CONCESSION

ALTHOUGH oil received a large measure of attention from the Colombian Congress at its recent session, adjournment took place on December 18 without final action on the revision of the nation's petroleum law. This statute has been on the books since 1931, and proposals to modify some of its provisions have been before the legislators at every session for the past several years. Successive Ministers of Petroleum and various commissions appointed to study the subject have submitted amendments or complete revisions from time to time. The texts of these proposed bills, the reports accompanying them and the debates to which they have given rise would fill volumes, but none of them has succeeded in surmounting the Congressional barrier, though often the failure to obtain action was due to political conditions having no relations to the merits of the proposals submitted.

It is generally agreed that the present law is archaic and that some of its provisions, such as the difficulties that attend the clearing of titles and the delays in passing upon applications for concessions, have seriously impeded the development of the nation's petroleum resources. The latest bill submitted to Congress at its recent session received the approval of the House, but some of the amendments offered in the Senate were attacked as being even more discouraging to prospective investors than anything in the present law. Study of the proposed changes in committee was not completed in time to permit final action, and the whole matter goes over to the next session. At that time it is expected that the Minister of Petroleum will have a new measure to submit which probably will be drawn up with the assistance of the National Petroleum Council.

While the fundamental law governing the granting and operation of concessions remains unchanged, Congress did enact another law of importance to the oil industry and one that may affect the future course of Colombia's oil economy. This is a measure relating to the future of the De Mares concession, the oldest and most important commercial field in Colombia. The field was developed and operated by the Tropical Oil Company under a concession which expires in August 1951, when the property reverts to the government.

The De Mares concession was originally granted in 1906, but no real development was done until after the Benedum-Trees interests purchased the properties in 1916. The Tropical Oil Company, organized by Benedum and Trees, brought in the discovery well in 1918 and in 1920 the company was sold to International Petroleum Company.

Originally the concession was granted for a term of 30 years from the beginning of "exploitation," and there was considerable controversy as to the exact date when "exploitation" began. This date was not fixed until as late as 1944, when the courts held that active "exploitation" did not begin on the date of the discovery of oil but rather on August 25, 1921, when Tropical began its intensive work of development.

Production from the field began on a substantial scale in 1926 and reached its peak in 1940 with

an average of nearly 59,000 barrels daily. By September 1948 it had fallen to 31,449 barrels daily. The yield from existing wells is expected to decline steadily. Possibilities of increased output seem to be limited to the installation of secondary recovery or to the drilling up of one section of the area which heretofore has not been tested. Either project will require a large additional capital investment. From the government's viewpoint, however, acquisition of the property will bring possession of Tropical's refinery at Barranca-Bermeja which provides a substantial part of the country's requirements of oil products and so reduces expenditures for imports.

The Barranca-Bermeja refinery is a skimming lube and asphalt plant with a capacity of about 22,000 barrels daily. The lube plant is equipped with a phenol extraction unit for the production of quality lubricating oils for the Colombian market. A 65-mile, six-inch product line connects the plant with Puerto Berrio for more ready distribution of finished products. This line reverts to the Colombian government along with the refinery and producing properties. Crude lines of Andian National Corp. Ltd., are operating under a 50-year concession granted in 1923 and do not revert to the government for many years yet. The Andian system consists of 10 and 12-inch looped lines from the concession to the coast and has a capacity of about 60,000 barrels daily. While the Magdalena River is navigable as far as the concession, it is more economical to ship crude by pipeline because of difficulties of navigating the meandering stream with its many sandbars, particularly in the low-water season.

According to the terms of the law a company referred to as a Colombian YPF is to be organized, either as a government-owned enterprise or with the participation of private capital. If a mixed company is organized, the government will contribute the property which it takes over, at an appraised valuation, as its share. If conditions make it necessary to operate as a wholly-owned government project, it may pledge oil revenues under specified terms to provide capital.

To the corporation when organized, the government will issue a public service concession which, it is assumed, will do away with the troublesome strikes that have interrupted company operations during the past two years. The law also provides that the National Petroleum Council shall act as consultant on labor and social benefits affecting the company personnel and in establishing the participation of its workers in future profits.

Congress also approved the companion law No. 59 which authorizes the company to construct additional links in the products pipelines connecting the refinery with Bogota and other inland markets.

There has been some discussion about the desirability of erecting additional refineries at other parts of the country to lower the dependence of Colombia on foreign oil refineries. The problem of distribution in Colombia is difficult because of the terrain, the country being split into sections by three great mountain ranges which are hazardous to traverse in the rainy season because of the torrential downpours complicated by land and rock slides. At the moment Tropical Oil Co. has a virtual monopoly on oil distribution in the nation. Other companies appear to have no desire to compete because of the difficulties involved and the poor prospect for profits. The profit possibilities are largely limited by government price-fixing regulations.

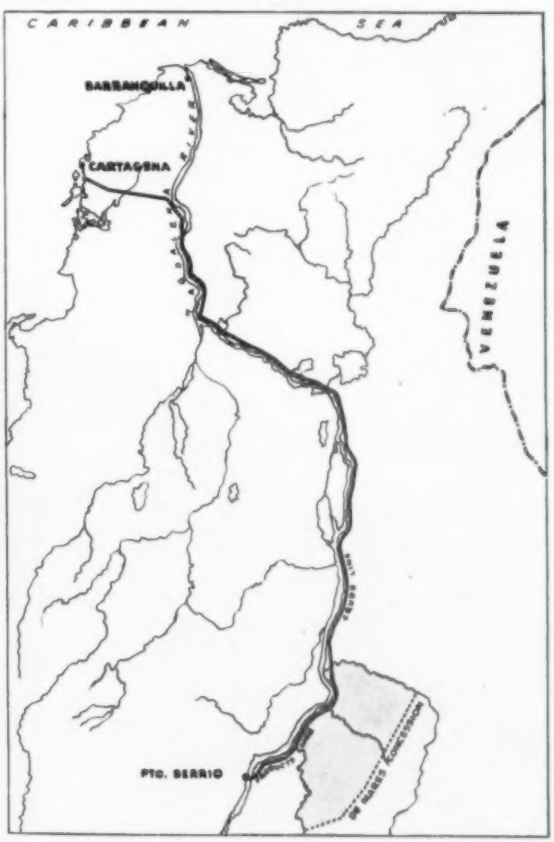
At the moment investment by Colombian nationals in the proposed new YPF is not attractive because of the low rate of return in prospect. Most enterprises in Colombia which are financed by Colombian capital receive a much higher return than YPF will offer. It is considered possible however that investment in the company may be made by Colombian capitalists for political reasons in spite of the poor profit prospects.

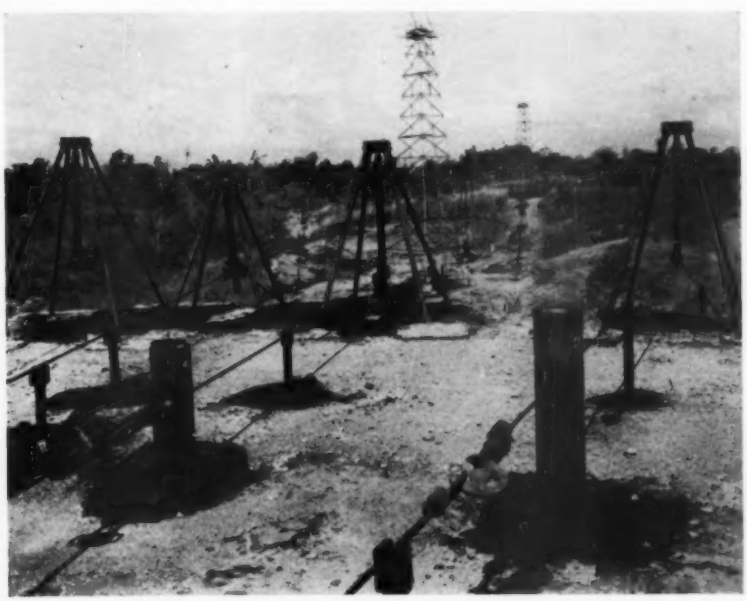
It is much too early to predict final method of handling the De Mares concession. Instead of direct operation by the Colombian YPF, it is possible that Tropical may be invited to continue as the operator because of its long association with the property and knowledge of its possibilities. New capital will be required for additional drilling, installation of secondary recovery equipment and for refinery construction, and this could come partly from Tropical participation as a part owner of the company and partly from Colombian capital.

Of interest to all importers of goods and equipment is the economic law which changes the official exchange rate from 175 to 195 pesos per $100, which means that 11.4 percent more in pesos will be received from dollar imports. Dollar imports of oil and equipment by oil companies are currently running at the rate of $38,000,000 per year. Another section of the law allows the government to make use of $95,000,000 of loans for industrial and agricultural purposes and earmarks some of the funds for study and construction of pipelines.

Map indicating location of the De Mares concession on the Magdalena river with its crude pipeline connection to the Caribbean and products line to Puerto Berrio. →

Much of the production from the De Mares concession now is being pumped. ↓





NEW SYNTHETIC ALCOHOL FROM GASOLINE IS DEVELOPED FOR PLASTICS INDUSTRY

By W. Clark

COMMERCIAL production of synthetic iso-octyl alcohol from petroleum recently was announced by Esso Standard Oil Co. Shipments are being made currently in tankcar quantities from the plant at Baton Rouge, La.

Production of this new eight-carbon-atom, primary alcohol from low-cost raw materials will be of great importance to the plastics industry which has been using alcohol obtained from expensive coconut and castor oils in the formulation of plasticizers. Ethyl hexyl alcohol, which is somewhat similar to iso-octyl alcohol, has been selling at about 30½ cents per pound. It is valuable as a raw material for the manufacture of plasticizers which are necessary to make such plastics as vinyls into flexible supple upholstery and other fabrics.

The new synthesis by the Oxo process is a two-step, continuous process for the conversion of seven-carbon-atom olefins into the eight-carbon-atom alcohol. The original Oxo process was developed by the Germans during World War II for the production of synthetic alcohols. Details of the process were made known by the British Intelligence Objective subcommittee. It is an adaptation of the earlier Fischer-Tropsch synthesis for the production of synthetic hydrocarbons.

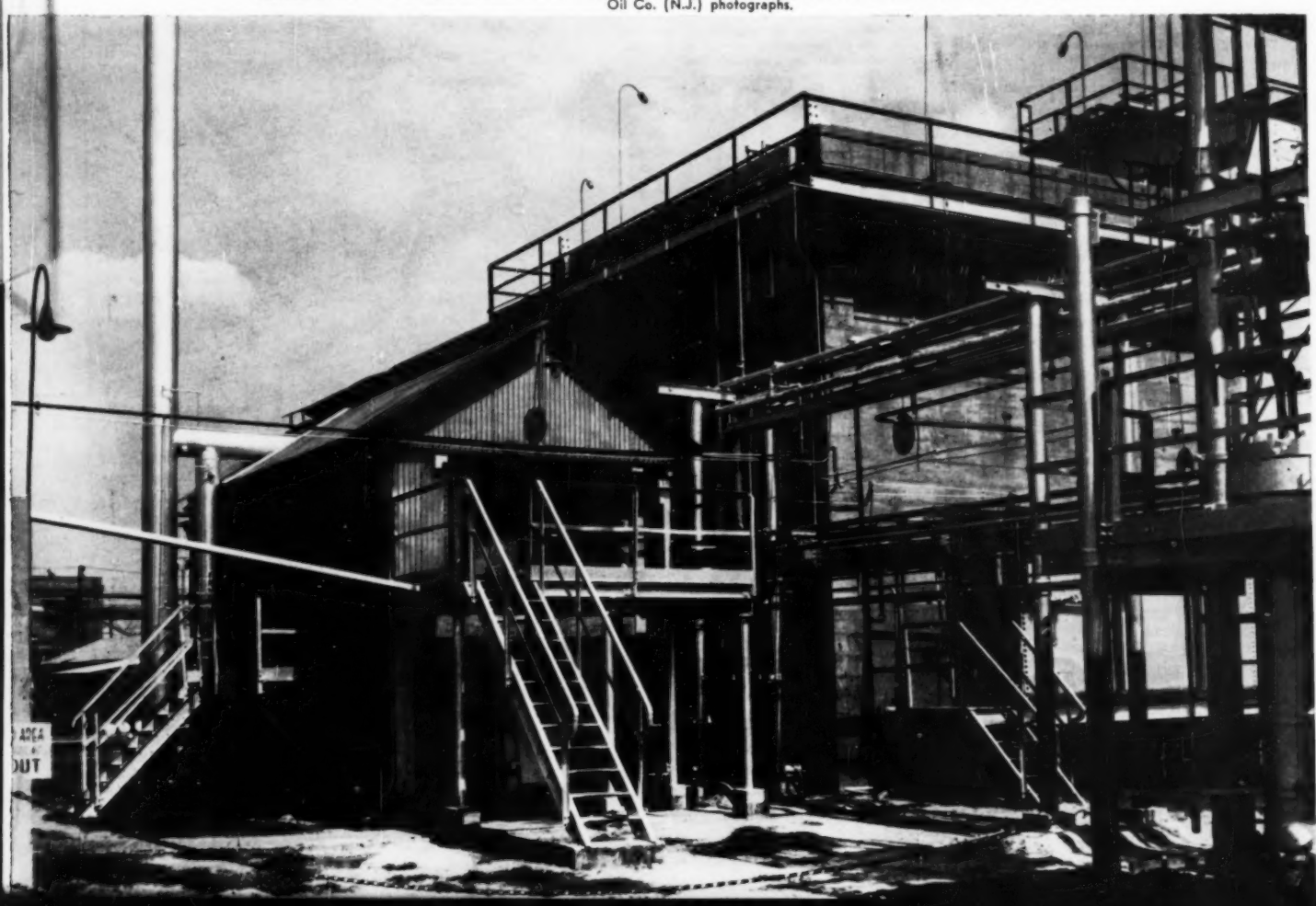
Discovery of the Oxo reaction is credited to the Ruhrchemie A. G. in 1939, and a commercial plant was erected at Oberhausen-Holten with a capacity of 10,000 tons per year of primary alcohols. Raw materials at the plant were C_{10} to C_{18} olefins from a Fischer-Tropsch plant. These olefins were modified by the addition of carbon monoxide and hydrogen to give normal and branch chain aldehydes which were sulfated for the production of detergents.

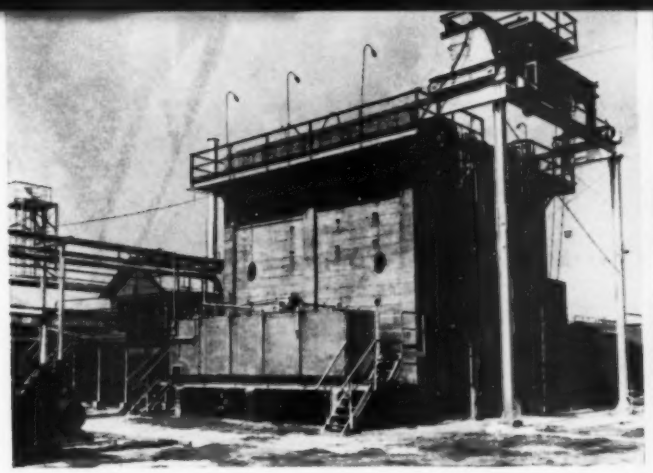
The raw materials for the Esso process are heptene, carbon monoxide and hydrogen. The starting olefin may be obtained either by fractionation from cracked gasoline or by catalytic polymerization of unsaturates in the cracking still gases. Esso Standard is not obtaining its heptene from gasoline. Elimination of the frac tion from gasoline would require superfractionation techniques and thus would complicate refinery procedures and equipment.

The carbon monoxide and hydrogen mixture, called synthesis gas, would be prepared in a typical plant in the following way. Oxygen and purified gas are preheated and then burned without a catalyst in a synthesis chamber under a pressure of 300 psi. The temperature of combustion is kept above 2400°F, and the natural gas is converted into hydrogen, carbon monoxide and carbon dioxide.

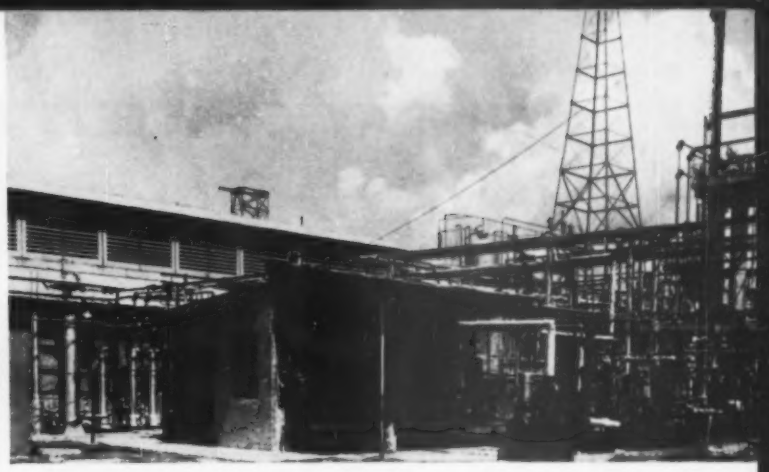
After combustion, the synthesis gas is cooled in a waste heat recovery system, where it produces byproduct steam. The synthesis gas is then passed

Furnace at left in which feed materials are preheated at 3,000 psi before being sent to reactors in concrete stall at right. Standard Oil Co. (N.J.) photographs.





Reinforced concrete stall housing iso-octyl alcohol reactors showing crane for servicing.



General view of iso-octyl alcohol processing area, control house in foreground, compressor house at rear.

into a reaction chamber where it is brought into contact with the heptane. Here, under proper conditions of heat and pressure and catalyst, the seven-carbon, unsaturated hydrocarbon is converted into an eight-carbon aldehyde, octanal. This is called the oxonation phase and is the first step of the process employed by Esso Standard. The second step is the hydrogenation of this eight-carbon aldehyde into the corresponding alcohols. The hydrogenation is carried out under a pressure of 3,000 psi in tall reactors which are enclosed by reinforced concrete walls.

The end-product is a high yield of octyl alcohols consisting principally of a mixture of four to six carbon-atom, straight-chain alcohols with appropriate side chains each.

The alcohols are purified by distillation, and the decomposition products, namely unreacted heptene and octanal, are recycled.

The Standard Oil Company (N. J.) has invested $10 million for research on development and adaptations of the Fischer Tropsch synthesis since the end of World War II. Adaptation of the Oxo process for the commercial production of the iso-octyl alcohol was the climax of three years of concentrated laboratory and pilot plant experimentation. The large demand for this synthetic alcohol assures that it will easily be absorbed by industry.

New sources have long been sought for plasticizers for the ever-expanding vinyl plastics industries. Plasticizers when compounded with resins impart the flexibility characteristics to the finished plastics material. The shortage of primary chemical type, high molecular weight plasticizers (most octyl type plasticizers have a molecular weight above 390,) has greatly hampered, not only by expense but by actual availability, the growth of these versatile plastics. Polyvinyl chloride constitutes the largest volume of the vinyl resins produced, and it, with its copolymers, is most affected by the shortage.

For a general survey of the situation the following estimates have been made: The production capacity of polyvinyl chloride and its copolymers for 1948 has been computed to be in the neighborhood of 300 million pounds. This volume requires roughly 120 million pounds of suitable plasticizers whose production in 1948 only amounted to between 55 and 60 million pounds.

The situation is directly related to the limited supply of high molecular weight, primary alcohols. Secondary alcohols (with the alcoholic -OH radical inside the carbon chain as compared to the terminal position of the alcoholic -OH group in primary alcohols), are comparatively plentiful but are unsuitable for this type of plasticizer. Only a new source of primary alcohols could meet these demands.

Of the four major primary-type vinyl resin plasticizers, the phthalate and phosphate esters rate first and second in importance. The lower molecular weight phthalate esters, such as dimethyl, diethyl, dibutyl and diamyl (one, two, four and five carbon atom chains respectively), phthalates, are rarely used because of their volatilities. The volatility of a plasticizing compound is a measure of the increase which a plastic will undergo in hardness with eventual brittleness and low flexibility on aging. Dioctyl phthalate is the most widely used vinyl plasticizer, and of the 34 million pounds of phthalate plasticizers produced annually, it accounts for probably around 30 million pounds. Of the phosphate ester plasticizers, tricresyl phosphate (another derivative of octyl alcohol), is second in importance to dioctyl phthalate. The total production of phosphate plasticizers is about 15 million pounds per year.

The specific importance of the Oxo process is its adaptability for the production of a variety of long-chain, high molecular weight alcohols, depending on the starting olefin. This offers possibilities for newer, even more suitable, high molecular weight, primary-type plasticizers of nine and above carbon atom chains. In addition to the importance of the octyl alcohol derivatives as plasticizers for vinyl resins, they have yielded very favorable results when used to impart flexibility to synthetic rubbers such as Perbunan. Perhaps eventually the profitable synthesis of edible, straight-chain glycerine fats will become a reality. The prime consideration for the immediate future of the chemical synthesized by Esso Standard is the increased production of primary octyl alcohols from which so many important plasticizers are derived. Until larger scale production of the synthetic alcohol can be undertaken, however, the largest percentage of the output will be consumed by the vinyl and related plastics industries.

Other oil companies also are working on the production of higher alcohols. Shell Oil Co. now is producing commercial quantities of a seven-carbon-atom alcohol, methyl isobutyl carbonal, at its Houston refinery where glycerine recently was synthesized commercially. The Shell alcohol also has a branched configuration which makes it especially desirable as a plasticizer.

Standard Oil Co. of Indiana, is producing small quantities of nonyl alcohol currently for research and development purposes and expects to be in commercial production before the year is over. Nonyl alcohol as manufactured by Standard of Indiana is a mixture of branched-chain, primary alcohols, the principal component being a group of trimethyl hexanols with dimethyl heptanols as a minor component. Nonyl alcohol has an approximate boiling range of 384-394° and specific gravity of .845.

It can be esterified by conventional techniques. It and its lower boiling esters should find various uses in the solvent and solvent-modifier fields. Its higher boiling esters are of demonstrated value as plasticizers, being compatible with a wide variety of synthetic resins. Three such esters which can be used as plasticizers in a typical polyvinyl chloride-acetate compound are dinonyl phthalate, dinonyl adipate and trinonyl phosphate.

Nonyl alcohol gives the characteristic reactions and derivatives of primary alcohols. Oxidation yields nonanoic acid, a liquid to about —40°F, with valuable properties, particularly for the preparation of metallic driers. Condensation of nonyl alcohol with ethylene oxide also leads to interesting products.

Standard of Indiana has not made public the manufacturing methods it will use in the production of nonyl alcohol. It has been suggested that the Indiana company may start with diisobutylene instead of heptane as the New Jersey company does.

SUNRAY CONVERTS 100 OCTANE PLANT

TO PROFITABLE PEACETIME USE

WHEN the war ended in 1945, the government-owned 100-octane gasoline plant of Associated Refineries, near Duncan, Oklahoma, was shut down. Doubt existed generally that it could ever be operated profitably under peacetime conditions.

Unlike most of the wartime 100-octane units, the Associated plant was not built adjacent to a large refinery from which it drew its raw materials and into which it could be fitted. The plant was built as an individual unit at a centralized location in Duncan where it could draw its charging stock from a group of relatively small refiners. None of the individual plants in the group could supply enough charging stock to operate such a plant, but the group as a whole was able to pool its stock and produce about 250,000 barrels per month of urgently needed aviation gasoline.

Doubts that the plant would operate in peacetime now have been dispelled. Today this refinery, having been purchased from the government by Sunray Oil Corporation, is daily processing about 20,000 barrels of Oklahoma crude after one of the most remarkable reconversion jobs in the history of the oil industry. The plant is making a variety of products—not 100-octane gasoline—and has earned a profit from the first day it went into operation as a Sunray refinery.

The beginning of the story goes back a couple of years and introduces Floyd L. Martin, executive vice president of Sunray. It was largely due to his vision coupled with sound judgment that the government facilities were purchased and that they have been converted economically into a successful commercial refinery.

Principal elements of the government plant were a two-stage, fluid catalytic cracking plant with a charging capacity of 12,000 barrels of fresh feed per day; a gas concentration system, a hydrogen fluoride alkylation unit, which produced 2,500 barrels per day of alkylate; an isomerization plant capable of producing 300 barrels per day of isobutane; and a modern boiler plant consisting of five boilers, each delivering 55,000 pounds of steam per hour at 275 pounds pressure. The plant had been producing about 250,000 barrels per month of 100-octane gasoline during wartime.

Auxiliary equipment included three large forced-draft cooling towers, necessitated by the heavy water requirements of the alkylation plant. A plentiful source of water supply was obtained

Floyd L. Martin, executive vice president, Sunray Oil Corp.

through an eight-mile pipeline to Lake Duncan. Tankage included rundown, charging stock and product storage tanks, among which were three 80,000-barrel floating-roof gasoline tanks and a number of spheres for the storage of butane, isobutane and butylenes. Usual auxiliary structures included warehouses, garage, a well-equipped machine shop, a big pumphouse, elecric substations and loading racks for tank cars and trucks.

The tract on which the units were located is large, allowing for future expansion, and was enclosed by a high wire fence. Roadways and walks were paved with asphalt. An adequate crude supply was at hand from the nearby Velma field; low-cost electricity and natural gas were available.

Mr. Martin engaged Universal Oil Products Co. to study reconversion possibilities. After thorough study of all factors involved, a plan was developed and purchase of the plant was recommended. UOP assisted in the negotiations with the Defense Plant Corporation that culminated in the plant's transfer to Sunray in October 1947.

The problem was to transform the refinery to profitable commercial operation as speedily and as economically as possible, making use of existing facilities to the fullest extent and buying a minimum of new material and equipment. The project was laid out and all elements for reconversion were designed by Universal engineers. The general contractor was Refinery Engineering Company of Tulsa, which did all the construction work except that on the cat cracker.

The refinery possessed no crude or products pipelines to afford cheap transportation, inasmuch as it had been designed to operate exclusively on gas oil, which was delivered by truck from eight nearby refineries, and to produce aviation gasoline which was shipped out by tank car.

While the reconstruction work was in progress at the refinery, Sunray crews laid an eight-inch products pipeline from Duncan to Allen, where Sunray's 12,000-barrel refinery is located. This 100-mile line was required for products exchange and to connect with Sunray's branch of the Great Lakes products pipeline to northern consuming centers. At the same time a short crude line was being laid to the Velma field as the first part of a crude oil gathering system now being built to various fields in south-central Oklahoma. Three modern pipeline pump stations and eight 80,000-barrel storage tanks were constructed at Allen, Wynnewood and Duncan. At Drumright, Sunray finished products are delivered to the Great Lakes Pipe Line system through an 83-mile, eight-inch line from Allen.

There was no topping unit, which is an essential requirement for a refinery running crude oil, and there was no desalting equipment, a necessity for treating Velma crude which is high in salt, sulfur and asphalt content. Furthermore it was seen that a vacuum unit would be needed to recover the heavy, waxy gas oil from the topped crude and that a vis-breaking operation would be required to make a salable fuel oil from the heavy residue. There was no provision for treating the products of crude distillation.

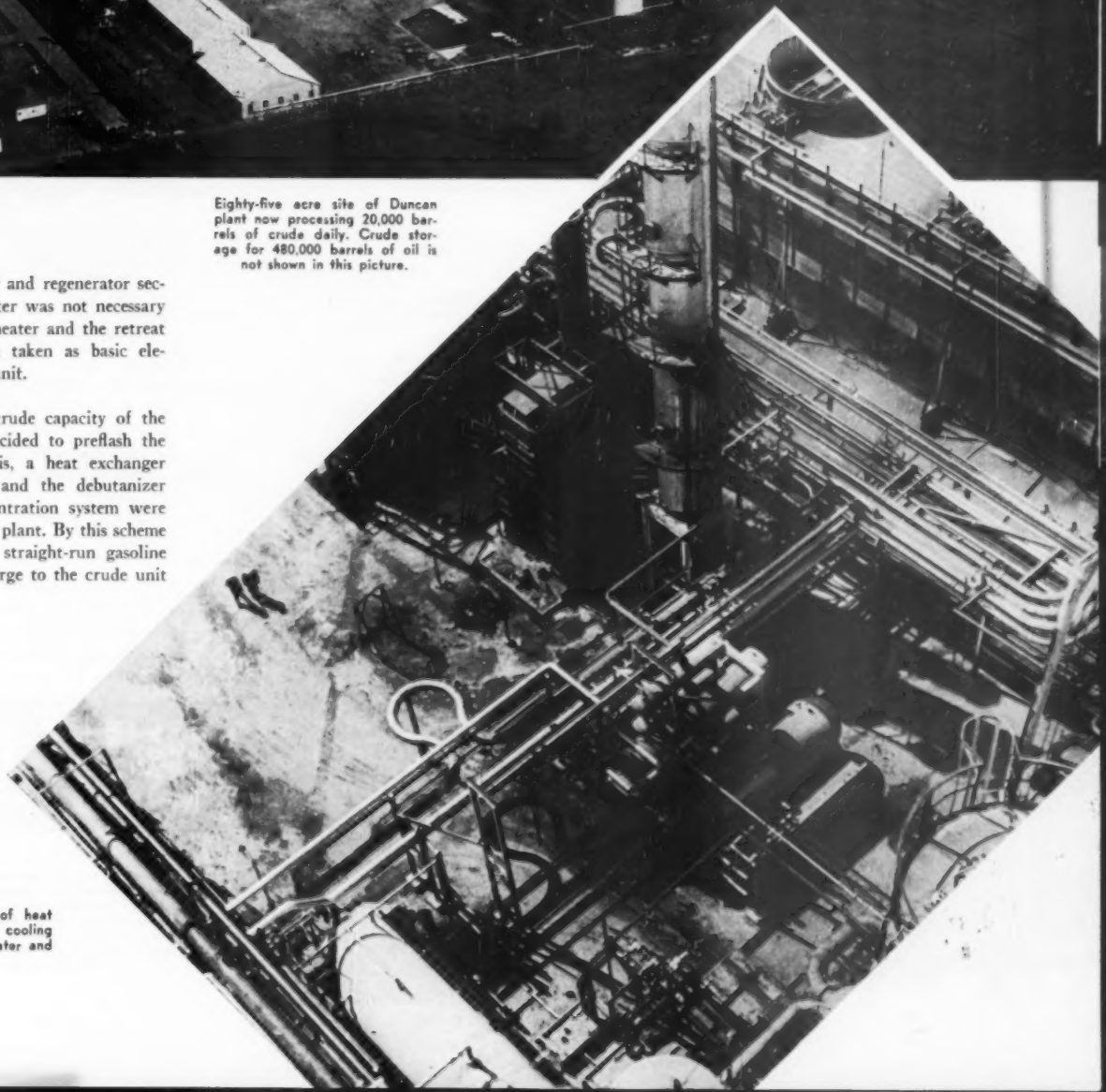
As operated in wartime, the light gases from the cat cracker were charged to the alkylation unit to produce aviation alkylate. That procedure being considered no longer advantageous under the proposed new operating schedule, it was desirable to install a polymerization unit and a propane separation unit to prepare this product for the LPG market. It was necessary to install additional tankage in connection with this operation.

The cat cracker, as before mentioned, was built for two-stage operation, one stage for cracking fresh gas oil and the other for retreating the cracked gasoline. The two stages had a common regenerator but two reactors, two large fractionating columns and separate auxiliaries such as condenser boxes. In the reconversion plan it was proposed to operate the cat cracker as a single-stage unit, which required extensive

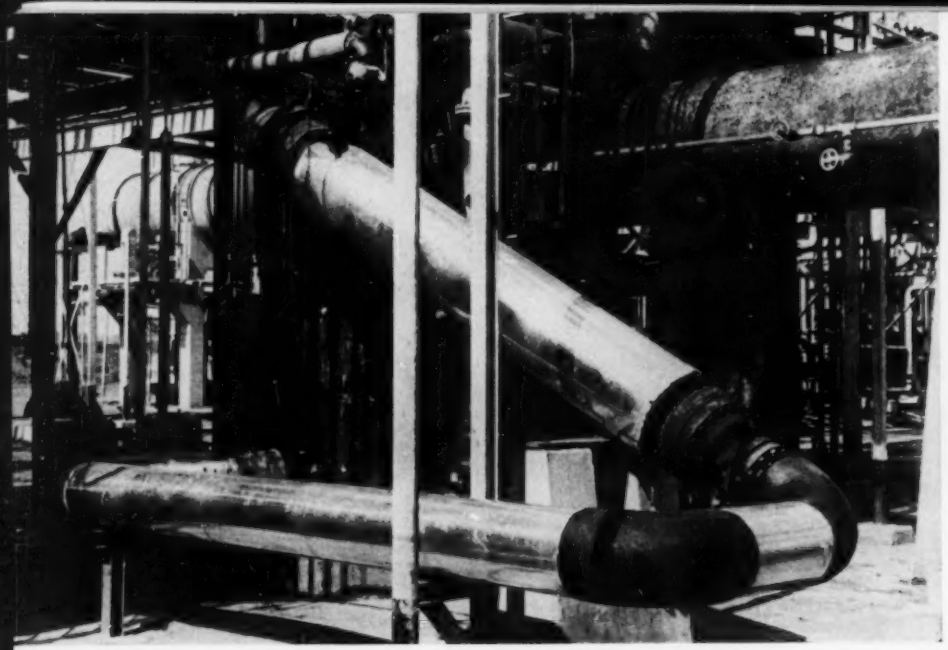
Eighty-five acre site of Duncan plant now processing 20,000 barrels of crude daily. Crude storage for 480,000 barrels of oil is not shown in this picture.

changes in both the reactor and regenerator sections. The large feed heater was not necessary for this operation, so this heater and the retreat fractionating column were taken as basic elements for a new topping unit.

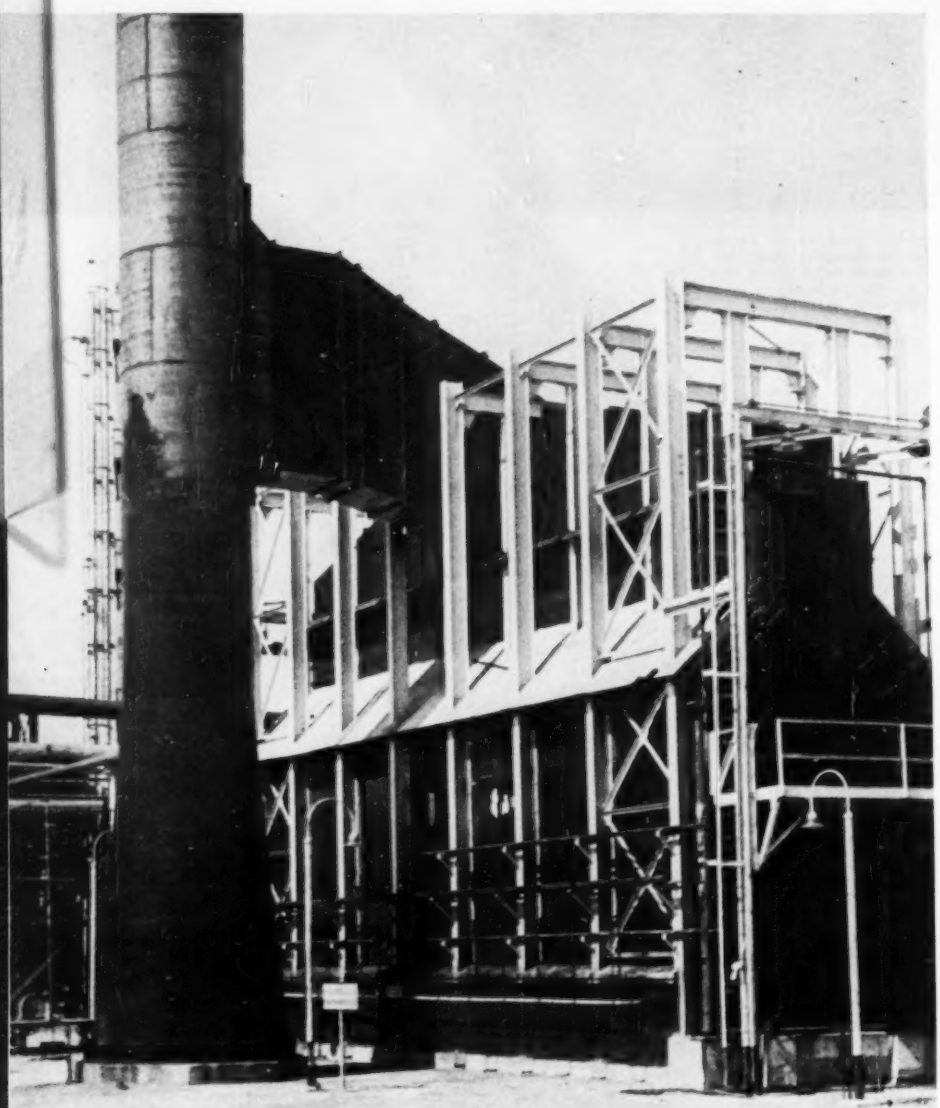
In order to increase the crude capacity of the converted plant, it was decided to preflash the crude. To accomplish this, a heat exchanger from the alkylation unit and the debutanizer tower from the gas concentration system were combined into a preflashing plant. By this scheme about 15 percent of light straight-run gasoline is flashed off when the charge to the crude unit is perheated to about 400°F. The improvised crude unit and the preflashing system give the plant its 20,000-barrel per day crude capacity.



View from cat cracker of heat exchange equipment, cooling tower and vis-breaker heater and tower.



Reboiler for debutanization of polymer gasoline. Unit formerly was installed in isomerization unit. Butane laden polymer gasoline enters at bottom, flows upward into the debutanizer column, such flow being caused by the thermo-syphon effect of the heating medium which, in this unit, is steam.



Former cat cracker preheater furnace now converted to serve as heater for stripped crude from pre-flash tower bottom. Handling 18,000 barrels of crude daily the heater removes 2,500 barrels of light gasoline, 2,180 barrels of heavy gasoline, 3240 barrels of distillate and 3240 barrels of distillate. The 7,020-barrel residue is charged to the new vacuum unit.

A large settler from the alkylation unit was converted into a vacuum unit, with the addition of a small heater and necessary auxiliaries.

A poly unit was built to handle the gases from the crude unit and the cat cracker. A propane unit also was installed. These were constructed by the utilization of equipment on the ground, with the exception of the poly unit reactors and the propane storage tanks, which were bought new. Treating equipment for the various products was likewise built.

Actual construction work was begun in October 1947. On December 5 the desalter and crude unit went into operation. In the meantime construction of additional storage had been going ahead so that sufficient tanks were completed to store the products which were to be further processed when the necessary elements of the plant became ready.

Construction of the vacuum unit had been so timed as to have it ready for operation before the accumulated stocks of topped crude from the operation of the crude unit became too great. All the light products from the crude unit were immediately made salable, the necessary treating facilities having been provided in advance.

Using one of the existing towers, the straight-run gasoline was stabilized to remove propane and lighter fractions, including hydrogen sulfide. The vacuum unit flashed off gas oil as charge for the cat cracker, leaving heavy asphaltic bottoms of high viscosity. In order to render this rapidly accumulating material salable and dispose of it before the storage tanks were filled, the next two moves were to get the vis breaker into operation to reduce the viscosity of the vacuum bottoms, and to start up the cat cracker which would produce low viscosity material for blending.

While work on the cat cracker proceeded, the gas concentration system was being remodeled to separate the large quantities of propane, propylene, butanes and butylenes which the cat cracker would produce, and the poly unit was being constructed to convert these fractions into polymer gasoline. The timing was accurate. Both the gas concentration system and the poly plant were ready when the cat cracker was placed on stream.

Fractionating equipment was installed to separate butane from the poly unit's effluent gases, and this butane, stored in the spheres, is used for blending with gasoline from the Allen and Duncan plants to control vapor pressure. Equipment was installed for separating, liquefying, treating and drying the propane, which is then stored in new propane storage tanks for sale as LPG. Treating facilities for poly feed and product were ready on schedule.

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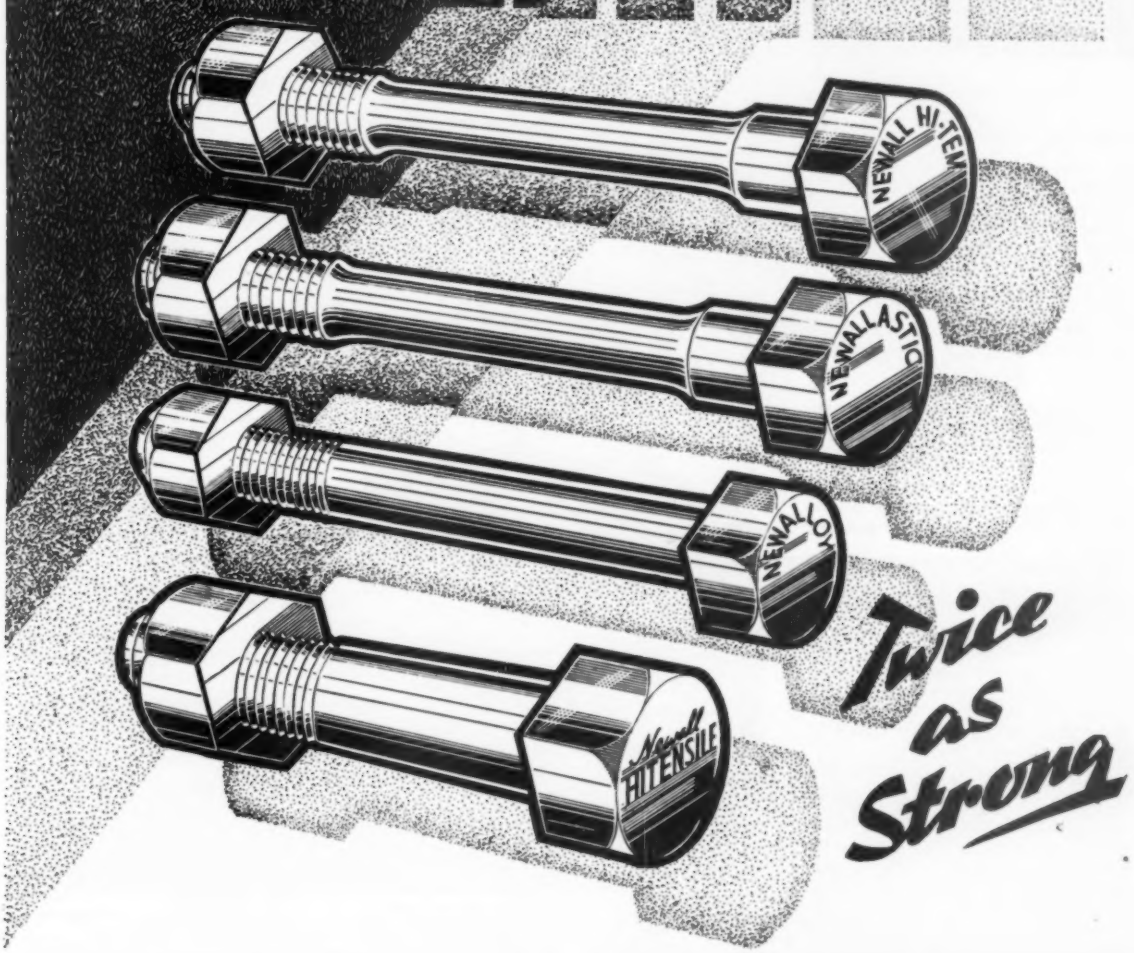

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International News and Notes

W. H. Siems

Completes Three-Month Tour

W. H. Siems, export sales manager of Hughes Tool Co., has returned to New York after a three-months' tour of the oil centers in Europe, England the Middle East. Following initial conferences with British operators, Mr. Siems visited Scandinavian operations in Sweden and Denmark, viewing first-hand the progress and problems of those two countries in oil development. After visiting Turkish oil operations, Mr. Siems included both France and Italy on his touring agenda, thence returning through Iraq, Iran, Kuwait and Algiers.

The completed trip required more than three months and afforded first-hand information on current drilling practices, supply requirements and other vital data on the export fields in the areas visited for a report to Hughes executive management in Houston. R. G. Roberts, European division sales manager for Hughes Tool Co. with headquarters in London, accompanied Mr. Siems on the trip.

Scottish Oils Plant Approved

Plans have been approved by Grangemouth Dean of Guild Court for the £7,500,000 extension to the existing Scottish Oils Ltd. refinery. The proposals will double the capacity of the plant and provide the most modern type of plant in existence in Britain for the production of high-grade motor spirit by the catalytic cracking process. The project is the largest ever promoted in this area and follows the approval of the £5 million project covered last month. This involves the production of chemicals from petroleum, the plants to adjoin each other.

This final approval clears the way for the official starting of this long projected scheme which will make Grangemouth one of the most important petroleum industry centers in Britain. Annual production from the Scottish Oils Ltd. plant will be in the region of 205,000 tons of motor spirits and 370,000 tons of heavy fuel oil. Other products will include kerosene, gas oil and tractor fuel. Middle East crude oil will be used, and dock facilities are being adjusted to handle this new and expanded traffic.

New Chief Anglo-American Chemist

E. J. Boorman, A.R.C.S., B.Sc., Ph.D., A.R.I.C., D.I.C., F. Inst. P., has recently been appointed chief chemist of the Anglo-American Oil Co., Ltd. Having carried out several years post graduate research at the Imperial College of Science and Technology, he became a member of the Department of the Government Chemist, where he was concerned with analytical, fiscal and legal aspects of petroleum products. Soon after the end of the war he joined the staff of Esso Development Co., Ltd. From his post as head of research group there, he was transferred to his present position with the Anglo-American Oil Co., Ltd.

Balkassar Production Rises

The Attock Oil Company, Ltd., is currently surveying the situation in Pakistan where the chairman is now on a visit. Increased production from Balkassar, following chemical treatment of well No. 3, indicates that this field is likely to prove capable of sustained and satisfactory production. The pipeline from the Balkassar field has been linked to the Khaur-Rawalpindi railroad line.

Canadian Magnetometer Survey

First flights for 1200-square mile airborne magnetometer survey near Trenton, Ontario, will be made this month by Aero Service Corp. of Philadelphia. The survey is being made for the Province of Ontario. Ed Canfield, veteran Aero Service pilot, will be in charge of the survey. Robert W. Pate will head the magnetometer staff.

Arthur J. Curtice

Form Prospecting Company

Organization of Conorada Petroleum Company as a joint enterprise of Continental Oil Company, Ohio Oil Company and Amerada Petroleum Corporation was announced last month. The new corporation has been formed for the purpose of combining efforts to investigate prospects for the development of oil-producing properties outside the United States. It has a nominal capitalization, and advances for its investigations including geological exploration will be made by the parent companies. Actual acquisition of promising prospects and their subsequent development will be carried on either by the parent companies direct or by subsidiary companies to be organized for such purpose.

Directors of Conorada Petroleum Corporation include L. F. McCollum and James J. Cosgrove, Continental Oil Company; J. C. Donnell II and W. B. Emery, The Ohio Oil Company; and A. Jacobsen and E. H. McCollough, Amerada Petroleum Corporation.

The seventh director and president is Arthur J. Curtice, who will be in direct charge of operations. He is an internationally known consultant in geology and petroleum engineering. For the past several years he has been associated with Hoover, Curtice & Ruby, Inc., and its affiliates. That firm and Mr. Curtice individually have acted as technical advisers to numerous governments in Latin America and in the Middle East and have participated in the formulation and drafting of petroleum legislation for such governments. Mr. Curtice has traveled extensively in South America and the Middle East and is widely recognized as an authority on petroleum legislation and concession contracts.

The firm of Hoover, Curtice & Ruby, S. A. of Venezuela, of which Mr. Curtice was president, has been dissolved. The name of Hoover, Curtice & Ruby Inc., which continues in business, has been changed to Exploration Contractors, Inc.

New "Shell" Director

Harold Wilkinson, C.M.G., president of Shell Caribbean Petroleum Co., Inc., and of Asiatic Petroleum Corp., New York, has been elected a director of The "Shell" Transport and Trading Company, Ltd., London. The election was effective Jan. 1.

Mr. Wilkinson joined the Royal Dutch-Shell Group of companies in 1922 and worked in Singapore, London and South Africa before joining Asiatic in 1931. During the recent war he was British petroleum representative in Washington from 1942 to 1945. He was decorated by the British government in 1946 in recognition of his services to the nation.

Hydrogenation Operations In Germany

A report published by Foreign Commerce Weekly indicates that the ban on hydrogenation operations in western Germany is likely to be raised in the case of two plants, these being the Union Rheinische Braunkohlenkraftstoff AG. at Wesseling near Colgone, and the Gelsenberg Benzin A.G. at Gelsenkirchen.

The plant at Wesseling has concluded a contract with Shell to distill gasoline from crude oil and hydrogenate residues of crude oil. Shell will deliver the crude oil, which is to be processed into gasoline and diesel oil. The agreement provides for a monthly supply of 30,000 tons (approximately 220,000 barrels) of crude oil, from which 15 to 20 percent gasoline and 30 to 35 percent diesel oil will be obtained by the cracking process. The remainder, approximately 50 percent, is to be processed at the hydrogenation plant where 80 percent of this residue is to be processed into gasoline by adding hydrogen.

Operations at the Gelsenberg plant, under contract with Standard, will be similar to those as Wesseling. The plant at Gelsenberg, however, is severely damaged, and it will be some time before the 50,000-ton (360,000 barrels) monthly operating capacity is reached.

Venezuelan Production

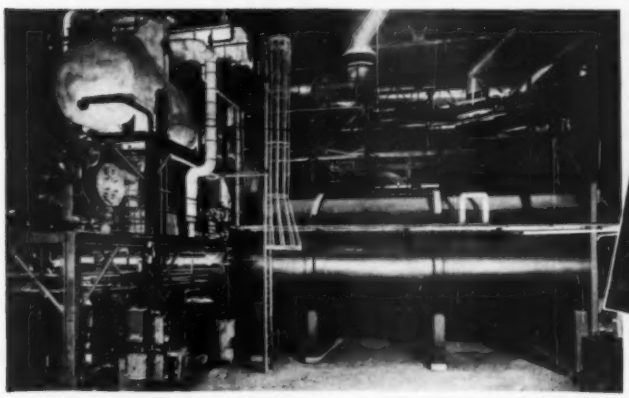
Production of crude oil in Venezuela during the month of November amounted to 40,859,396 barrels, an average of 1,361,980 barrels daily. As compared with October, this daily average is lower by 20,857 barrels. Exports for the month amounted to 35,533,462 barrels. Production by companies is shown in the following table:

Company	West	East	Total
Creole	13,940,623	4,791,470	18,732,093
Mene Grande	1,875,574	4,800,177	6,675,751
Shell	12,897,160	—	12,897,160
Sinclair	—	519,111	519,111
Socony	—	957,300	957,300
Texas	—	277,842	277,842
S. A. P. Las Mercedes	—	364,038	364,038
B. C. O.	37,032	—	37,032
Phillips	—	51,807	51,807
Rexco	57,830	—	57,830
Atlantic	—	289,432	289,432
Total barrels	28,808,219	12,051,177	40,859,396

World's Largest

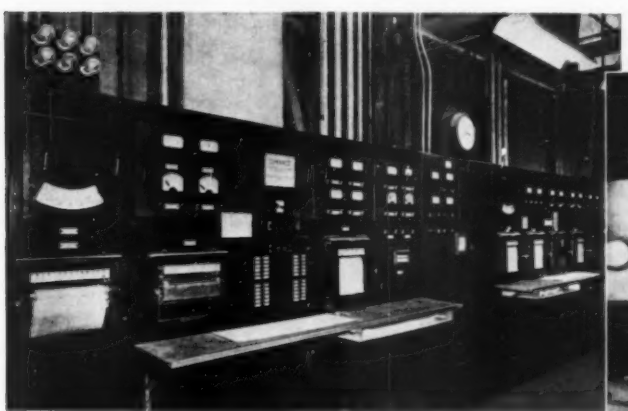
single unit sulfur burning contact acid plant

This sixth Chemico Contact Sulfuric Acid Plant for Standard Wholesale Acid and Phosphate Works in Baltimore, Md. was successfully placed in operation in December, 1948 and is regularly operating above guaranteed capacity of 500 tons per day. (100% equivalent H_2SO_4).



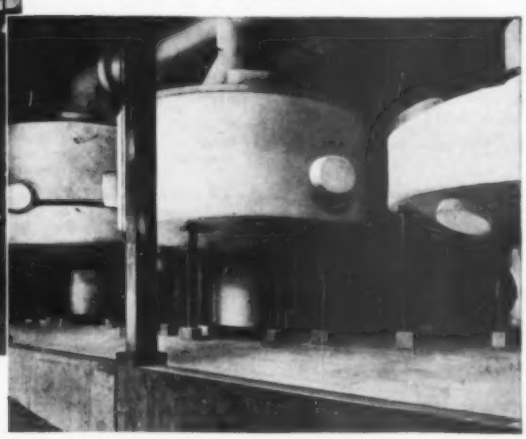
▲ At the right is the Sulfur Furnace with the waste heat boiler, condenser and auxiliary apparatus at the left. This furnace burns over 170 tons of sulfur a day.

▲ Towers for the production of oleum, 98% acid and for the drying of combustion air. These are part of the drying and absorption system.



▲ Here are control panels for two of the six Chemico Contact Acid Plants. The new 500-ton plant panel is on the right.

▼ Shown left to right are the secondary converter, the primary converter and the gas filter.



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SOHIO Seeks Guatemala Concession

Negotiations are in progress between The Standard Oil Co. (Ohio) and the government of Guatemala for an oil concession. Sohio has been conducting geophysical exploration work since December 1947 and expects to do exploratory drilling within an area of approximately two million acres in the northeastern part of Guatemala, distant some 40 to 50 miles from the coast. If oil is discovered, Sohio will construct a pipeline, 80 to 100 miles long, probably to a terminus at Puerto Barrios.

Earl W. Wallace, Sohio vice president in charge of production, has been in Guatemala recently to confer with government officials and expects to go there again at a later date. Negotiations for the contract are being conducted with the administration of Guatemala but require congressional approval. The congress is in special session, but its regular session does not occur until March.

"Redeventza" Becomes "Albatros"

Following certain changes in the financial interests directing the well known Belgian refining company, "Redeventza," the name of the corporation was changed at the annual meeting held in January to "Albatros" S. A. Belge pour le Raffinage de Petrole. A new board of directors was appointed including Mr. Leon Ponet, avocat honoraire, Antwerp; H. Stuart Ebben, chairman of Manchester Oil Refinery, Ltd.; A. Van Berchern, partner of Pictet et Cie., Geneva, and S. R. Jarvie, director of Raven Oil Company, Ltd. At the same time it was announced that reconstruction of the company's refinery at Antwerp, which was badly damaged during the war, had been completed and that the first cargo of Middle East crude had been received.

The "Redeventza" plant was erected in 1935 and is the largest in Belgium with an estimated throughput of about 900,000 barrels per year.

Regent Purchases ROP Ltd.

Purchase by Regent Oil Company of London, which is controlled jointly by Trinidad Leaseholds, Ltd., and California-Texas Oil Company, of the property and distribution facilities of Russian Oil Products Ltd., marks the formal retirement of the latter from the retail sale of oil products in the United Kingdom. Actually Russian oil has not been a factor in the British market since the commencement of World War II, when control of all oil supplies was vested in the Petroleum Board and private brands disappeared, but the physical assets of ROP, including its bulk storage plants, its fleet of rail and road cars and other distribution facilities, have been maintained in efficient condition under the direction of the Board. With the dissolution of the Pool and the return to private competition, Regent takes possession of this equipment and is in a favorable position to compete for a share in the British market.

Russian Oil Products, Ltd., was registered as a British company in 1924 with a capital of £100,000. Prior to that time imports of Russian oil into Britain had reached substantial proportions amounting to between five and six million tons annually in the form of bulk sales to distributors. These sales were handled by commercial agents, two of whom, P. Rabinovitch of Arcos and R. Terakopoff, London, representative of the Naphtha Syndicate of Moscow, became the first directors of ROP, Ltd. With the organization of that company, the Russians entered the retail field and steadily increased their volume of sales up to 1941 by maintaining prices somewhat below those of the other established companies. At the same time similar sales organizations were established in other countries, and the Soviet Union became an important factor in the international oil trade.

In the early 30's the surplus of world production forced oil prices to their lowest levels. At the same time adoption of the program for Russian industrialization under the successive five-year plans lead to a rapid increase in the consumption of oil products within the Soviet Union and brought about a slowing down in export. Russia withdrew from its retail operations in various countries. Just before the outbreak of war in 1939, it was reported that negotiations for the sale of its British business were under way, but if so, these were cancelled by the outbreak of hostilities.

At the time of the recent sale, a statement by ROP declared that the transaction had no political significance and that the company was merely retiring from retail business while continuing to make bulk sales.

New Shell Subsidiary

A new Shell subsidiary has been announced to function as a financing company with special interest in Venezuela. Registered as a private company with a capital of £1,000 in £1 shares, this subsidiary, the Shell-Venezuela Investment Company, will acquire and hold shares, debentures and other securities of any company (whether British or foreign,) which is mainly engaged in carrying on in the western hemisphere any of the businesses of producing, refining, storing, transporting, supplying, selling and distributing petroleum oil, or the products thereof, and the greater part of the operating assets of which are situated in the western hemisphere.

New Western Canada Pipeline Survey

A mosaic strip-map, made up of some 400 vertical air photographs taken and assembled by Photographic Survey Company of Toronto, Canadian associate of the Hunting Aviation Group, has been delivered to the Imperial Pipeline Co., Ltd., for use in planning the location and construction of a new 16-inch pipeline which will carry crude oil from Nisku, Alberta, to the refinery at Regina. The photomosaic covers a strip of territory 466 miles long and three miles wide.

The photographs were taken at a scale of one mile to the inch by an aircraft of Photographic Survey Company's fleet in approximately three hours flying time. In a matter of days the film was processed and printed, and prints were pieced together and mounted down in strip form by P. S. C.'s technicians. This mosaic strip was then rephotographed to provide handy sectional sheets and delivered to Imperial, along with additional prints of the original pictures for examination under a stereoscope.

Sells Royalite Holdings

Imperial Oil Ltd., has sold its entire holdings of Royalite Oil Co., Ltd. to Dominion Securities Corp., Ltd. at $23.25 per share. The sale involves approximately 90 percent of the 717,487 shares of Royalite now outstanding. Imperial Oil stated that the sale would make Royalite an independent organization, enabling it further to expand its operations by the exploration and development of new areas.

New Anglo-Saxon Director

J. W. Platt, managing director of The Eagle Oil & Shipping Company, Ltd., has been appointed a managing director of The Anglo-Saxon Petroleum Co., Ltd., and of The Shell Petroleum Co., Ltd., London, and also a non-delegate member of the board of de Bataafsche Petroleum Maatschappij, The Hague. These appointments were effective Jan. 1, 1949, when Mr. Platt vacated his previous appointment as managing director of The Eagle Oil & Shipping Company, Ltd. Mr. Platt's successor was not announced.

Reduce Fuel Oil Prices

First firm in Britain to reduce fuel oil prices below the maximum prices authorized by the government is Shell-Mex and B. P. Ltd., who have announced a reduction of three-eighths of a penny per gallon on heavy fuel oil and one farthing per gallon reduction on fuel oil. Gas-diesel oil prices remain unchanged. Maximum prices took the place of fixed prices on Nov. 1, 1948.

Saudi Arabian Production

Crude oil production in Saudi Arabia during December amounted to 14,457,619 barrels or an average of 466,375 barrels per calendar day. The refinery at Ras Tanura ran an average of 118,063 barrels per day. Production for 1948 totaled 142,852,989 barrels, an average of 390,309 barrels per calendar day, and refinery runs averaged 123,186 barrels per day.

Royal Dutch Board Changes

At an extraordinary general meeting of shareholders of the Royal Dutch Petroleum Co. held in Amsterdam on Dec. 29, W. H. van Leeuwen announced that he would retire as chairman on Dec. 31, 1948, but would remain on the board. J. E. Aug. Kessler announced his resignation as director general, and the board appointed Mr. Kessler chairman of the Royal Dutch Petroleum Company to succeed Mr. van Leeuwen. B. Th. W. van Hasselt was named to succeed Mr. Kessler as director general.

Foreign guests at the December meeting of the Los Angeles chapter of Nomads. Seated, left to right: G. K. Monteney, Trinidad Pet. Development Co.; M. D. Freeland, Bahrein Pet. Co. Ltd.; C. D. Hendershott, Bahrein Petroleum Co. Ltd., and M. H. Jackson, Brown Drilling Co. Standing, left to right: T. A. Connor, Iraq Pet. Co.; E. G. Dobson, Texas Petroleum Co.; Charles M. White, Iraq Pet. Co.; H. D. Nunez of Socony-Vacuum Oil Co., and C. H. Strickland, Iraq Pet. Co.

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OIL COMPANY STAFF CHANGES

P. C. Spencer

James W. Foley

P. C. SPENCER has been elected president of Sinclair Oil Corp., to succeed H. F. Sinclair, founder of the company. Mr. Sinclair relinquished the presidency after 33 years as its chief executive and was elected chairman.

Mr. Spencer has been president of Sinclair Refining Co., principal operating subsidiary of Sinclair Oil Corp., since September 1947 and executive vice president of the parent company. He has been active in the oil industry virtually all of the time since his army service in World War I. He joined Producers and Refiners Corp., in 1922 and entered the Sinclair organization when Sinclair purchased the Prairie Oil & Gas Co. of which P & R was a subsidiary.

In addition to his oil activities Mr. Spencer has held executive positions in a number of gas companies. He was president of Southwestern Development Co., and of Canadian River Gas Co., and vice president of Colorado Interstate Gas Co.

E. DUER REEVES has been elected executive vice president of Standard Oil Development Company, and Edwin J. Gohr, assistant manager of the research and development department, a vice president and director. Mr. Reeves was in charge of a research department that conducted the first experiments which resulted in development of the modern Fluid catalyst cracking plant. Mr. Gohr aided in designing the first Fluid catalyst cracking unit, which began operation in Baton Rouge in May, 1942. He also helped develop the design for the hydroforming process for transforming petroleum fractions into synthetic toluol.

NELSON JONES has been appointed general attorney for Humble Oil and Refining Co., succeeding R. E. Seagler. Mr. Jones has been a member of Humble's law department since 1937. He has resigned as a vice president and director to accept this new appointment.

OSGOOD V. TRACY has been appointed manager of the chemical products department of Esso Standard Oil Company. He has been assistant manager of the department and closely associated with the development of synthetic rubbers, alcohols and other chemical products from petroleum since he joined the company in 1930.

JAMES W. FOLEY has been appointed assistant to Vice President R. Ogarrio of The Texas Company's domestic producing department. He was formerly assistant division manager at Tulsa and will now make his headquarters at New York. Mr. Foley joined Texaco in 1932. From 1937 to 1940 he was petroleum engineer for Bahrein Petroleum Co., Ltd., on Bahrein Island in the Persian Gulf. Since returning to this country, he has served in Louisiana, Texas and Oklahome divisions.

RALPH O. RHOADES has been appointed chief staff geologist for Gulf Oil Corp. Mr. Rhoades has been with Gulf for 22 years, during which time he has served the company in Latin America, Europe and Asia. He was resident geologist in Kuwait during early years in the development of Gulf properties there. Later he was stationed at London as European representative of the production department.

GORDON S. CRANMER has been appointed general sales manager of the California Oil Co., eastern marketing subsidiary of the Standard Oil Co. of California with headquarters at Barber, N. J. Mr. Cranmer, who has been in the eastern area for the past three years, formerly was sales manager for Calso distributors. During the war he served five years with the aviation engineers. Starting as a captain, he became a full colonel before his discharge.

Gordon S. Cranmer

REESE H. TAYLOR, president of the Union Oil Co., of California, has been elected president of the Western Oil and Gas Association. He succeeds Ralph B. Lloyd, president of Lloyd Corp., Ltd., who has headed the association for the past seven years. The following officers were reelected: William Reinhardt, vice president of the Union Pacific Railroad Co., first vice president; William F. Humphrey, president of Tide Water Associated Oil Co., second vice president; L. K. Whittier, vice president of Belridge Oil Co., treasurer; John M. Peirce, executive secretary; and D. S. Kilgour, secretary.

E. C. PEET, formerly vice president and treasurer for Shell Oil east of the Rockies, has been named financial vice president in charge of the company's financial organization from coast to coast. J. H. White, vice president in San Francisco, moves to New York as vice president and controller, and A. G. Schei, treasurer of Shell Chemical Corp., becomes treasurer of Shell Oil Co.

J. D. ANDERSON, former division petroleum engineer at Casper, has been appointed manager of the purchasing department of Ohio Oil Co., Findlay, Ohio. E. W. Shoupe, former assistant purchasing agent, has been appointed purchasing agent.

P. C. LAUINGER has been elected to the board of directors of the Continental Oil Co. Mr. Lauinger is publisher of The Oil and Gas Journal, a director of the National Bank of Tulsa and a trustee of the University of Tulsa.

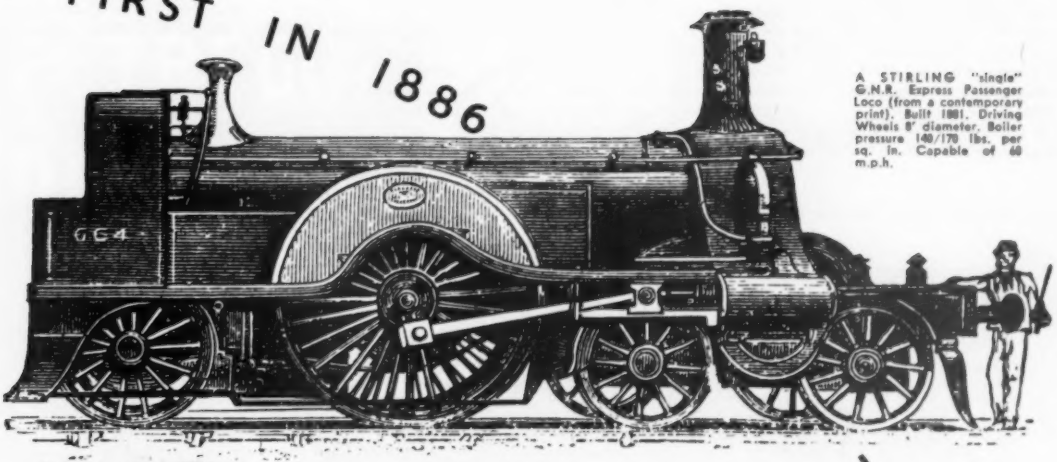
Ira H. Cram also has been elected to Continental's newly-created position of vice president in charge of exploration. He formerly served as manager of exploration for the Pure Oil Co. and is a past president of the American Association of Petroleum Geologists.

EMILE E. SOUBRY, coordinator of marketing of Standard Oil Co. (N. J.), has been elected a member of the board of directors. Mr. Soubry has spent all of his working years with the company and its affiliates in the United States and aboard, starting as a clerk in the shipping department of Anglo-American Oil Co., Ltd., in London in 1911.

Just before World War II Mr. Soubry was appointed chairman of the Anglo-American Oil Co., and during the war he served as liaison between the British Oil Trade Committee and the United States government. In 1943 he was appointed foreign marketing coordinator for Standard Oil and has directed all marketing operations since October 1947.

Emile E. Soubry

FIRST IN 1886



A STIRLING "single" G.N.R. Express Passenger Loco (from a contemporary print). Built 1881. Driving Wheels 8' diameter. Boiler pressure 140/170 lbs. per sq. in. Capable of 60 m.p.h.

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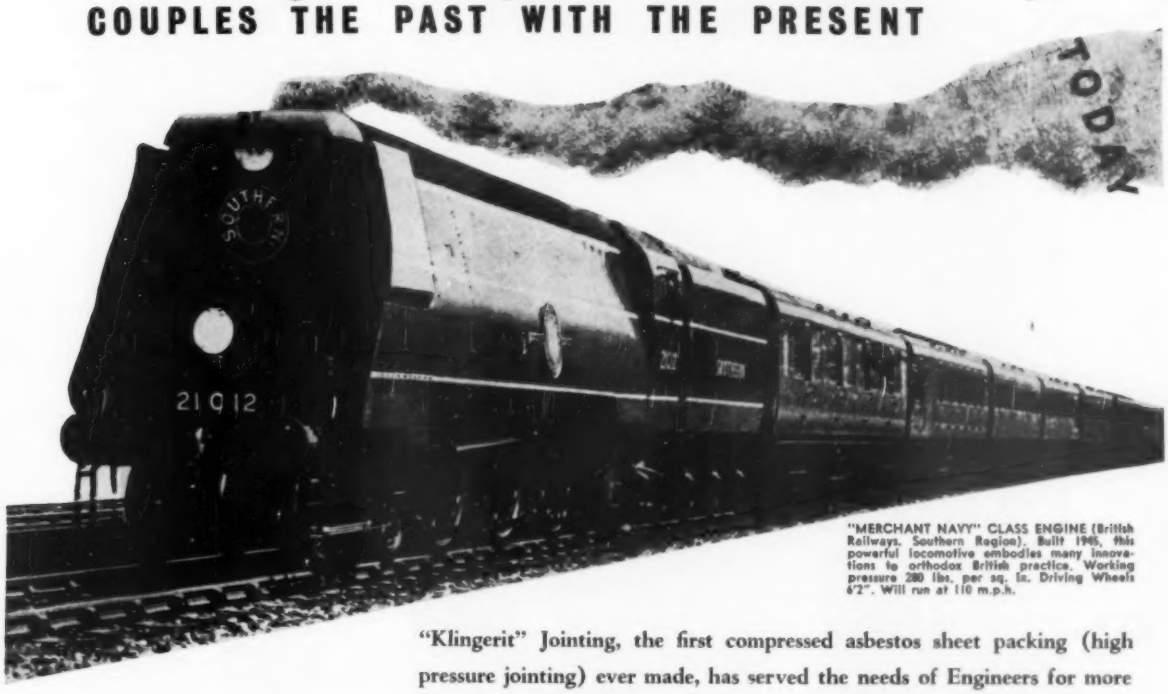

"MERCHANT NAVY" CLASS ENGINE (British Railways, Southern Region). Built 1945, this powerful locomotive embodies many innovations to orthodox British practice. Working pressure 280 lbs. per sq. in. Driving Wheels 6'2". Will run at 110 m.p.h.

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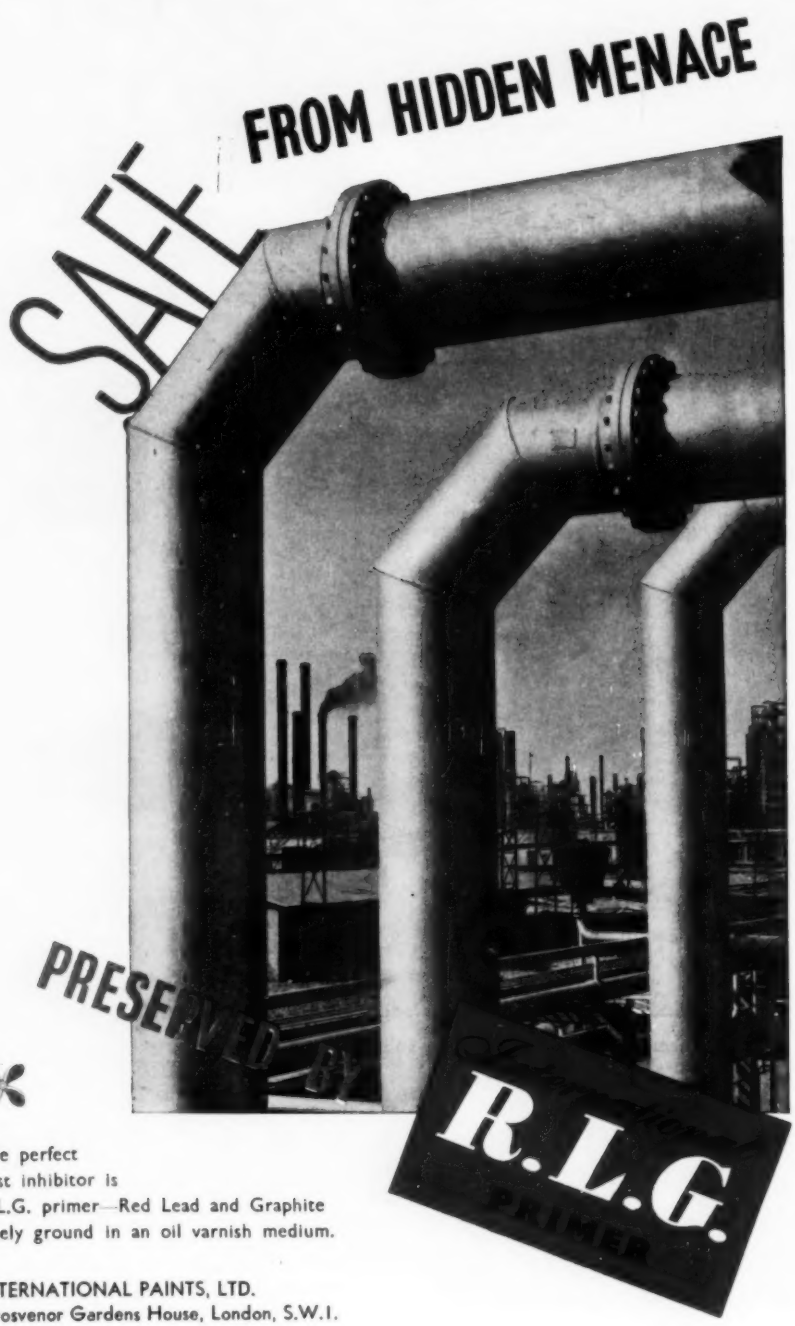
Cooper-Bessemer Wins Transcontinental Order

The Cooper-Bessemer Corp. has been awarded a contract for the construction of 21 new-type "Turbo-flow" gas-engine-driven compressors, the largest of their type in the world, for the Transcontinental Pipe Line Corporation's proposed 30-inch pipeline which is to be built by Fish Constructors Inc. of Houston, Texas. The award, announced by Gordon Lefebvre, president and general manager of Cooper-Bessemer, represents authorization to build 70 percent of the gas-engine-driven equipment required for their 1949 construction program.

The 10-cylinder GMW gas engines scheduled for this project are rated at 2,400 brake horsepower each. As a result of the "Turboflow" development, these engines will draw 15 percent less fuel from the line than formerly needed to operate conventional gas engines of equal horsepower. "It is conservatively estimated that well over 5,000,000 cubic feet of natural gas will be saved each day through the higher operating efficiencies of the new-type 'Turboflow' engines," Mr. Lefebvre explained. "The daily saving of five million cubic feet of natural gas will mean that much more available fuel to boost deliveries to industrial and domestic consumers in the East."

This big advance in engine efficiency is primarily attained by incorporating considerably improved combustion efficiencies in gas engines, obtained by a more intimate mixture of the gas fuel with air and unique developments in ignition design. In addition to 15 percent lower fuel consumption, "Turboflow" engines develop 10 percent more horsepower than other gas engines of the same size or equal displacement. This means simply that fewer engines will be required on a project of this kind, reducing both the number and cost of engine foundations necessary in the booster stations. In turn, this greatly reduces the overall cost of installation, piping, housing and operating personnel. Less maintenance expense will be a further cost-saving benefit to Transcontinental in the actual operation of the pipeline.



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Peter T. Lamont

PETER T. LAMONT, assistant coordinator of marketing for foreign affiliates of Standard Oil Co. (N. J), has been appointed coordinator of marketing. He succeeds Emile E. Soubry who was recently elected a director. John W. Connolly was named a deputy coordinator of marketing to serve with Weir R. Goodwin, who has occupied a similar position since September 1947.

Mr. Lamont has been with Standard Oil Co. (N. J.) and affiliates since 1922 with the exception of the war years. A commander in the United States Navy, he served as operations officer in charge of tanker movements for the Normandy invasion and planned the movement of gasoline and other oil products to the Allied beachheads.

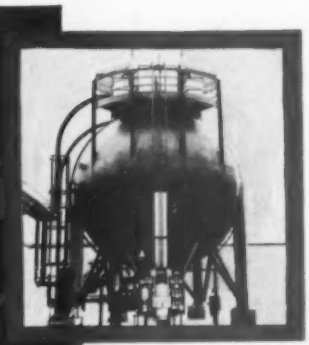
RAYMOND LEIBENSPERGER, chief geologist and head of Standard-Vacuum Oil Co.'s exploration department, retired the first of the year after having served for 30 years as a petroleum geologist in many parts of the world. Mr. Leibensperger spent 10 years in exploration work in Mexico with the Transcontinental Petroleum Co. In 1929 he went to the Netherlands for an affiliate of Standard Oil Co. (N. J.) and was transferred to Standard-Vacuum in 1933, remaining in the Netherlands until 1939. After his return to New York he directed Standard-Vacuum exploration in the Orient.

JOHN E. SWEARINGEN has been named executive assistant to J. E. Rouse, vice president in charge of operations for Stanolind Oil and Gas Co. He succeeds Lewis Finch, Jr., who has been transferred to Fort Worth as division engineer. Mr. Rouse also announced that G. F. Moore has been named assistant operating superintendent of the manufacturing department. Both men will be located in the Tulsa general office.

Simmons Heads Houdry Patents

Irving N. Simmons has been appointed head of the Houdry Process Corporation's patent division. Mr. Simmons has been with Houdry since the firm had its founding in 1931.

PETRECO DESALTING *Service Everywhere*



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PR-49-2

J. R. BAILEY, formerly superintendent of development, has been appointed assistant manager of Continental Oil Co.'s natural gasoline and gas division. F. B. Willson succeeds him as superintendent. Mr. Bailey joined Continental in 1940 as district engineer in the natural gasoline and gas division at Basile, La. Mr. Willson joined Continental in 1936 at Lance Creek, Wyo. He became assistant process engineer at Ponca City in 1943 and assistant to the manager of the division in 1946.

PAUL G. BLAZER, chairman of the Ashland Oil & Refining Company, has been named chairman of the Cincinnati branch of the Federal Reserve Bank of Cleveland for 1949. The Cincinnati branch comprises 56 counties in eastern Kentucky and 25 counties in southern Ohio. Mr. Blazer is also the recipient of the 1948 Sullivan Medallion awarded by the University of Kentucky. This is an annual award made by the university to the "most outstanding citizen of the year in the Commonwealth of Kentucky."

LEWIS W. MOORE has been elected president of Pan American Refining Corp. and Mexican Petroleum Corp., of Georgia to succeed D. J. Smith, who resigned as president of the two refining companies after serving in this capacity for four years. Mr. Smith will retain his position as chairman.

Mr. Moore was transferred from the research department of Indiana Standard in 1935 to join Pan American Petroleum & Transport. In 1945 he was appointed manager of research. He was appointed manager of manufacturing and elected a director of Pan American Refining, Pan American Production Co., Pan American Gas Co., Pan American Pipe Line Co. and Mexican Petroleum in 1947.

FRANK RICHARDSON has been appointed assistant to J. E. Howell, vice president of Lion Oil Co., in charge of production. The promotion was effective Jan. 1. F. E. Steele was advanced to general superintendent of production and J. E. Catlin to chief petroleum engineer. R. I. Williams was named division superintendent for Arkansas, Louisiana, Mississippi and south Texas.

P. E. Lakin

P. E. LAKIN has been appointed executive vice president of Shell Oil Company. He will serve as Shell's senior representative on the Pacific Coast with headquarters in San Francisco. Until his present appointment, he was vice president in charge of marketing, New York. Mr. Lakin began his career with Shell as a clerk in Seattle in 1915. He spent two years in France with the 96th Aero Squadron during World War I. In 1933 he was appointed sales manager of the midcontinent territory with headquarters in St. Louis, and three years later he became vice president in charge of marketing. Since 1942 his headquarters have been in New York, and in 1945 he was elected to the board of directors.

Three-Year Aerial Survey Planned

Anglo-Iranian Oil Co., Ltd., is launching a three-year program of aerial exploration of large tracts of Iran, through Hunting Aerosurveys, Ltd. This continues earlier work of the same type and is actually the sixth of such surveys to be made of Middle East areas. From the photographs taken by the crew of seven from heights of approximately 20,000 feet, large maps have been compiled demonstrating the resources of the area. Intention is to work six months of each year and to compile the data in the other six months.

Mitchell To Build Portable Rigs

Mitchell Engineering Co., Ltd., of England, has been licensed to manufacture the line of portable drilling equipment of George E. Failing Supply Co., of Enid, Oklahoma, in its plant located at Peterborough, 80 miles north of London. The Mitchell Company is one of England's largest and comprises some 18 different branches engaged in varied lines of manufacturing and construction work. It is operated under the direction of its founder, F. G. Mitchell, and his two sons, with executive offices located at No. 1 Bedford Square in London.

Abandons Lebanon Test

Lebanon Petroleum Co. has abandoned its test well drilled near Tripoli. The well was dry at a total depth of 10,060 feet.

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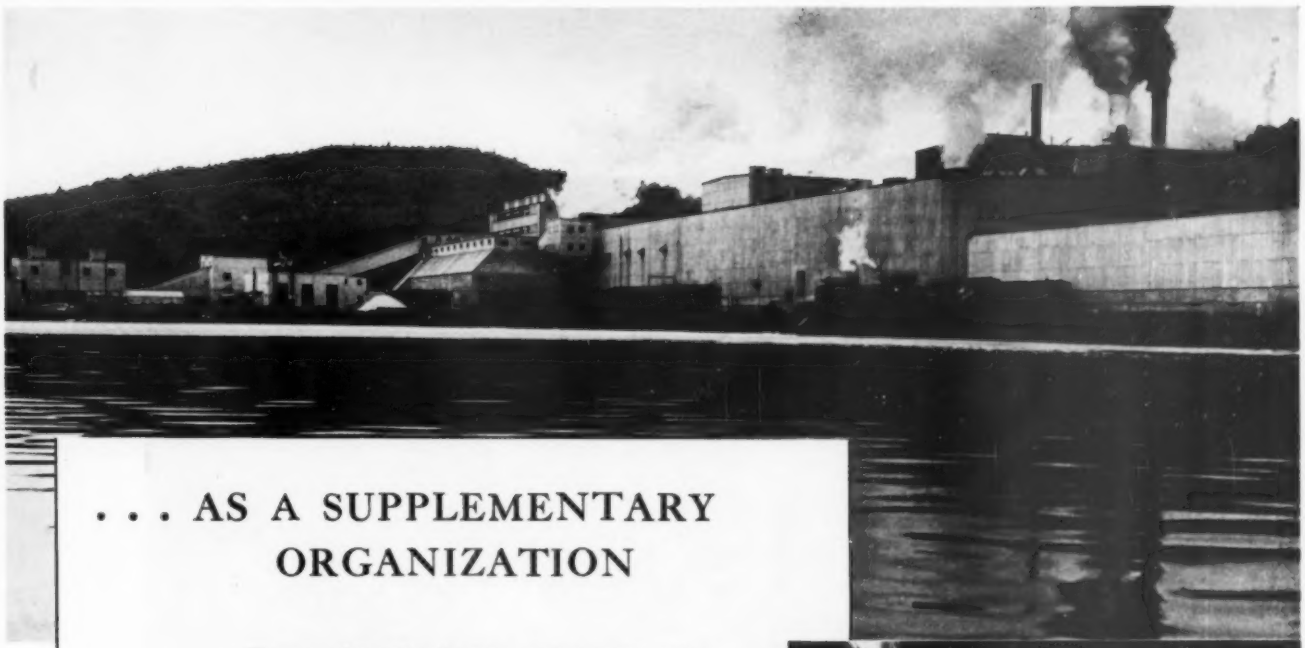
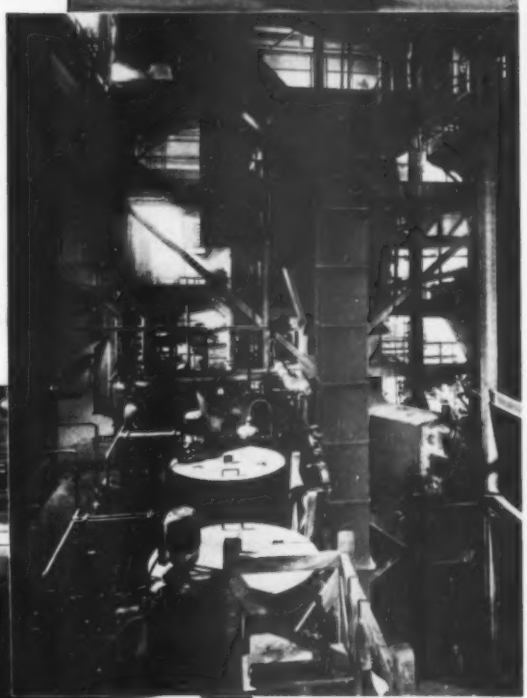


. . . AS A SUPPLEMENTARY ORGANIZATION

To expedite the design and construction of a Pulp Mill for Marathon Paper Mills of Canada, Ltd., Stone & Webster Engineering Corporation established a supplementary organization of engineers, specialists and draftsmen to act as part of the client's own engineering department. The Engineering Corporation also furnished consulting advice on special phases of the project and supervised all the construction.



The Bleached Sulphate Pulp Mill of Marathon Paper Mills of Canada, Ltd., located at Marathon, Ontario, on the North Shore of Lake Superior.

Above: Power and Recovery Boiler Room. Left: Machine Room — Dry End.

STONE & WEBSTER ENGINEERING CORPORATION

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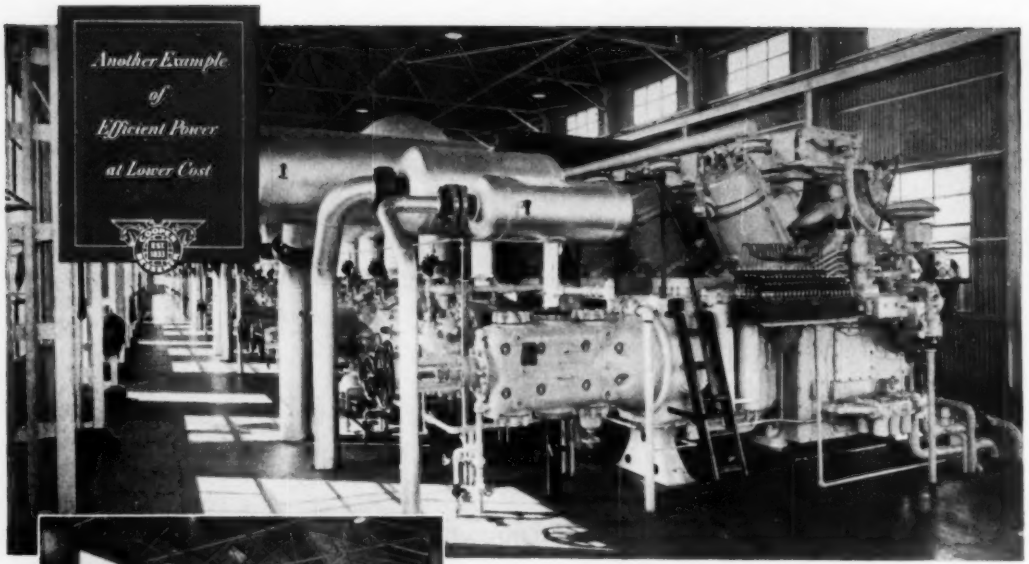
Another Example of Efficient Power at Lower Cost



• Engine side of the eight compact 1,000 hp GMV-angle compressors in Magnolia Petroleum Company's West Ranch gasoline extraction plant. Note trim, clean-cut appearance, typical of GMV installations.

• Main compressor house, containing Cooper-Bessemer GMV units shown and described above and at right.

How flexible GMV's meet the needs at Magnolia's West Ranch processing plant

THIS gasoline extraction installation is typical of the effectiveness of Cooper-Bessemer GMV-angle compressors in meeting virtually any combination of processing requirements.

Here, eight 1,000 hp GMV's each driving five compressor cylinders for four-stage compression, handle up to 26 million CFD of formerly flared gas, discharging at 1050 psig into Magnolia Petroleum Company's line to Beaumont. The gas is processed at the third stage discharge, maintained at a constant 325 psig. Automatic speed control and first and fourth stage variable volume unloaders maintain desired pressures and assure fully loaded engines at all times.

This space-saving GMV installation, as usual, is highly efficient, economically operated, completely dependable. As you plan your compressor requirements for the future, look into the new things, new advantages, new savings offered by one of America's *oldest* engine and compressor builders.

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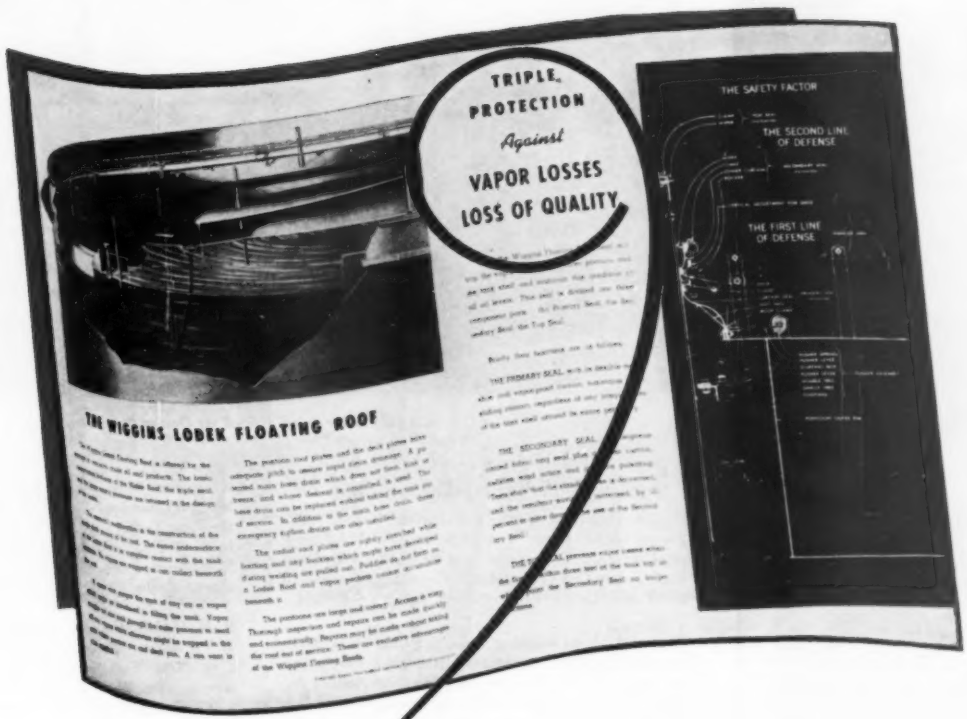
Seattle, Wash. Tulsa, Okla. Shreveport, La. St. Louis, Mo. Los Angeles, Calif.
Caracas, Venezuela Gloucester, Mass. Calmes Engineering Co., New Orleans, La.



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Improved Balloon Roof

The Wiggins Lodek Floating Roof

. . . designed specially for the storage of corrosive oil products. The entire under surface being in complete contact with the tank contents, no vapors are trapped or can collect beneath the roof.

The basic exclusive conservation features of the Hidek Roof including the triple seal and extra large pontoons are retained.

Write for bulletin FR-3 which gives further details on Wiggins Lodek Floating Roofs.

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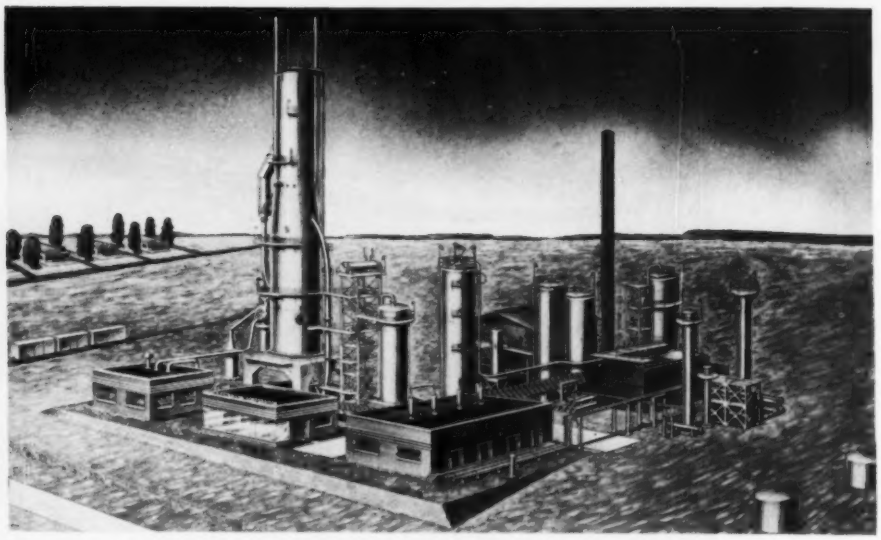

U.O.P. fluid cat cracker being erected for Cosden Petroleum Corp.

Cosden Erecting Cat Cracker

Cosden Petroleum Corp., Big Spring, Texas, broke ground Jan. 14 for a 6,000-barrel UOP fluid cat cracking unit. The plant will be built by Refinery Engineering Co., of Tulsa, Okla., under the direction of T. M. Lumly.

The new plant is being built fronting on a main traveled highway. Designers of the plant have taken advantage of this to create an advertising feature for Cosden. As indicated in the accompanying artist's drawing, the control room will face on the highway and will be glassed in like a showroom. The array of instruments in the specially designed room is expected to be of great interest to Cosden customers in the West Texas area where the company distributes much of its production.

Plans are to have the plant ready for operation by Dec. 1, 1949, only ten and a half months after ground breaking.

Platt Joins "Shell" Board

The "Shell" Transport & Trading Co., Ltd., announced that J. W. Platt, managing director of The Eagle Oil & Shipping Co., Ltd., London, has been elected a member of the board effective Jan. 1, 1949.

CHARLES A. PERLITZ, JR., Houston vice president and director of Continental Oil Company, has been appointed vice president and general manager of the company's operations in both the Houston and Fort Worth regions. His headquarters will be in Houston. He will supervise all of Continental's operations in both the Gulf Coast and Fort Worth areas, which include Texas, southeast New Mexico, Louisiana, Mississippi and southern Arkansas.

IRA H. CRAM, formerly manager of exploration for The Pure Oil Co., Chicago, was elected vice president in charge of Continental Oil Company's expanded exploration activities, effective Jan. 1, 1949. Mr. Cram, who was awarded his master's degree in geology at the University of Minnesota, has been associated with Pure since 1931, having been appointed manager of exploration in January 1948. He is a past president of the American Association of Petroleum Geologists.

EDWARD W. BELTZ, a petroleum geologist with 30 years' experience in many parts of the world, retired from Standard-Vacuum Oil Co. on Jan 1 to begin a new assignment with Arctic Contractors, Inc., engaged in developing the U. S. Navy Petroleum Reserve No. 4 at Point Barrow, Alaska. Formerly head of Standard-Vacuum's geological operations in the East Indies, Mr. Beltz is a veteran oil searcher in the Yukon, Alberta, Macedonia, Thrace, Trinidad, Madagascar and the southern half of the African continent, the Philippines, Sumatra and China.

R. B. MALONE, superintendent of the Pratt Works of the Socony-Vacuum Oil Co., Inc., in Long Island City, New York, retired Jan. 1 after 45 years of service. Dr. W. L. Linton, superintendent of the Sone & Fleming refinery, will become manager of all of the company's East River refinery operations. E. F. Pinney will be superintendent of the Pratt Works and assistant to Dr. Linton. F. W. Hadley is superintendent of the Sone & Fleming refinery and E. J. Tully is superintendent of the grease and compounding department.

Hi-Way To Enlarge Refinery

Hi-Way Refiners, Ltd., Saskatoon, Saskatchewan, Canada, will install a 2,000-barrel distillation unit and a 500-barrel Dubbs cracking unit. The enlarged refinery will process crude from the Leduc field in Alberta. Previously Hi-Way imported Texas crude, but the growing output of oil in the Prairie provinces is making it possible to discontinue these inshipments. Refinery Engineering Co., Tulsa, Okla., will erect the plant for Hi-Way Refiners.

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Oil Property Map
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&
Colombian Wildcat News

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Colombian Oil Statistics

Monthly data on all operations; producing; refining; exports; prices; drilling; consumption; imports oil products; etc. etc.

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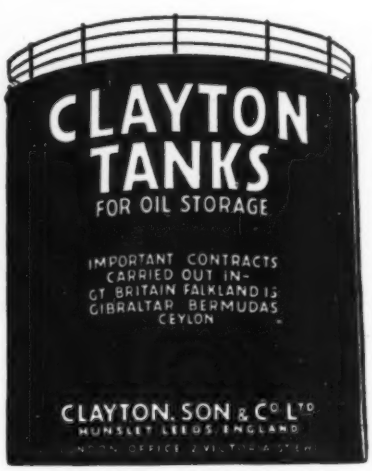
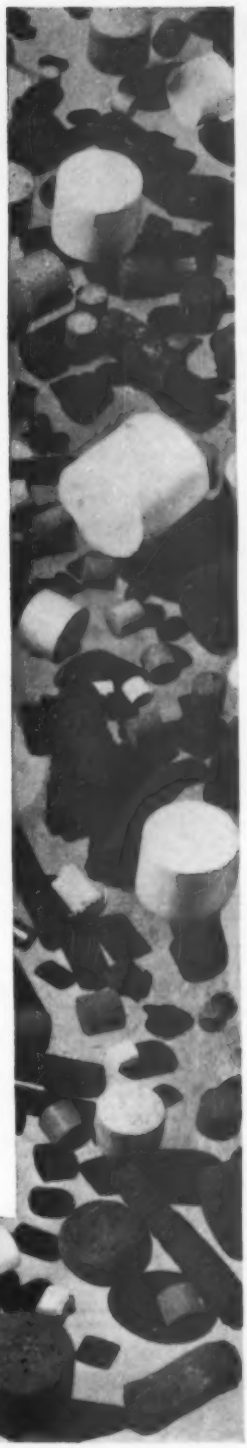


Harshaw

Tabletted and Extruded

Catalysts



Recent developments in the field of organic chemistry have resulted in many new processes which have made necessary a wide variety of catalysts. Harshaw pioneered in the development of preformed catalysts. Not only do we have wide experience in the development and use of tabletted and extruded catalysts, but in addition, we have a large capacity for producing them. If you have a catalyst problem, a discussion with us may be helpful.

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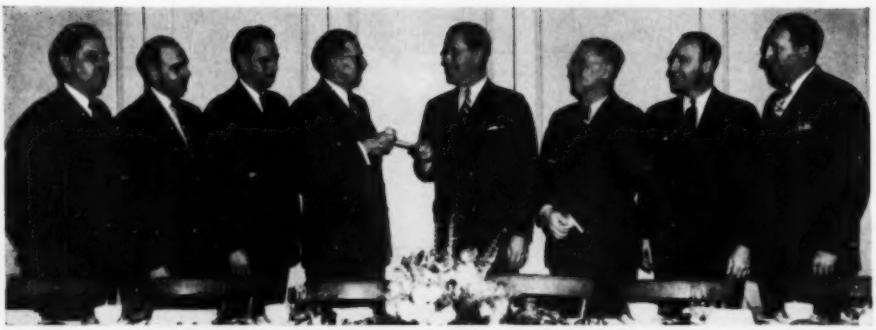

Val R. Wittich hands over his gavel as president of the New York chapter of Nomads to his successor, James W. Reed. Names of the officers, left to right: R. V. McIntire, secretary; M. F. Delano, assistant treasurer; C. P. MacDonald Jr., treasurer; Val R. Wittich Jr., out-going president; James W. Reed, president; W. D. Robinson, vice president; K. D. Demarest, assistant sergeant-at-arms; E. T. Landgraff, assistant secretary. Elected officers not present when photograph was taken are: Marvin D. Rasher, sergeant-at-arms and A. V. Simonson, regent.

Jim Reed Heads New York Nomads

At the annual election of the New York chapter of Nomads, officers were elected for the coming year as follows: James W. Reed, president; W. D. Robinson, vice president; Charles P. MacDonald, Jr., treasurer; Russ V. McIntire, secretary; E. T. Landgraff, assistant secretary; Marvin D. Rasher, sergeant-at-arms; Kenneth D. Demarest, assistant sergeant-at-arms; A. V. Simonson and Val R. Wittich, Jr., regents.

A rising vote of commendation was extended to the members of the 1948 administration, and a handsome cigarette container was presented to the retiring president, Val R. Wittich, Jr.

FOREIGN TANKSHIP CORP. has negotiated a loan of $25 million from the Equitable Life Assurance Society of the United States to supply a portion of the money required to build five new 28,000-ton tankers which have been contracted for with the Bethlehem-Sparrows Point Shipyard, Inc. It is guaranteed by Foreign Tankship's parent company, Standard Oil Co. of California. Bearing 2¾ percent interest, the loan will be due Dec. 1, 1961. The five tankers will cost approximately $30 million.

To Prospect for Gas in Britain

Imperial Chemical Industries, Ltd., has received a prospecting license covering 168 square miles in the county of York. It is understood that I.C.I. are interested in gas rather than oil and are concerned to investigate the possibility of substantial volumes of natural gas. The company has extensive plants at Billingham and Wilton, and successful boring for gas in this area would prove of very definite value.

Standard Log Form

The division of production of the American Petroleum Institute has announced publication of a recommended practice for a standard radioactivity log form for use in recording the data obtained from radioactivity surveys of deep wells. The log form was drawn up to ensure adequate and uniform reports so that the information collected could be interpreted properly now and in subsequent years. Copies of the recommended practice are priced at 50 cents each and may be obtained from the Division of Production, 1208 Continental Building, Dallas, Texas. Discounts are provided for quantity orders.

To Increase Tapline Capacity

The ultimate capacity of the Trans-Arabian pipe line can be increased to 500,000 barrels of oil daily as the result of a change in design announced by B. E. Hull, president of Trans-Arabian Pipe Line Company. The change in design was adopted because of recently revised forecasts of the prospective future petroleum needs of European countries and others west of the Suez Canal. The ultimate capacity can be attained with six auxiliary booster pump stations to reinforce Tapline's initial six pump station project.

Provision for the prospective future increase does not materially change steel requirements. For the 300,000 barrel project, 323,000 tons of steel are required for pipe, oil tanks, engines, pumps, terminal facilities and other structures. The 500,000 barrel project will require an ultimate total of 365,000 tons of steel. A fleet of 102 T-2 tankers or their equivalent would require 565,400 tons of steel to do the same job. Completion of Tapline's project is expected in the summer of 1950, contingent on resumption of pipe shipments this fall. The additional capacity can be attained within a year from that date.

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These are good reasons why it pays to "Buy International" for every oil field power requirement. See your International Industrial Power Distributor or Dealer for help in selecting the right International Power Unit for your job.

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POWER UNITS

Tulsa Nomads

Kenneth O. Hoevel of National Supply Company was elected president of the Tulsa chapter of Nomads and took office at the annual banquet on Jan. 12. Other officers of the chapter who took office at that time are: H. M. Cooley, Bethlehem Supply Company, vice president; George W. Davidson, Jr., W. C. Norris, Manufacturer, Inc., secretary; C. A. Nabors, Reed Roller Bit Company, assistant secretary; Mitchell Tucker, Oil & Gas Journal, treasurer; A. A. Roberts, Baroid Sales Division of National Lead Company, assistant treasurer; Opie Dimmick, Century Geophysical Corp., sergeant-at-arms; Harold E. Cooper, Fred E. Cooper, Co., deputy sergeant-at-arms; Mark D. Gilbert, Nordstrom Valve Division, Rockwell Industries, regent; Anthony Gibbon, Gulf Publishing Company, regent.

Hydra-Line Rig Tested

The Hydra-Line Division of Johnston Enterprises has just completed a destruction test on the small Hydra-Line rig which was displayed at the Tulsa Oil show last spring. Carrying its capacity load, this rig was cycled approximately 30,000 times before failure of a crown sheave bearing caused suspension of the test. The rig has done about four and one-half billion pounds of work, or the equivalent of almost three years of rod and tubing work based on fifty-two six-day work weeks.

Examination revealed that the pistons, nestable tubes, wire lines, sheave grooves, pump and other hydraulic parts showed little sign of wear. The XMD-975, which is the first "life-sized" Hydra-Line rig, was completed and ready for field test in January.

Lundquist Resigns

H. M. Lundquist has resigned as secretary-treasurer of the Iverson Supply Company. He has been an officer of the company since its inception in 1926. He is succeeded by Ed Robertson who will continue to act as sales manager. A. M. Iverson, of Salem, Illinois, moves to Tulsa as executive vice president.

Max B. Campbell Charles B. Caldwell

Hughes Tool Promotions

Max B. Campbell, former special representative in charge of the Dallas office of Hughes Tool Co., has been made division manager of the west Texas-New Mexico division with headquarters in Midland, Texas. Charles B. (Chuck) Caldwell, former special representative in Oklahoma City, has been promoted to special representative in charge of the Dallas office.

Promoted to newly created positions as regional office manager were: W. Clyde McMahon, former assistant office manager at Houston; W. O. Watson, former division officer manager of the Gulf Coast division; and R. D. Hood, former division office manager of the Oklahoma-Kansas division.

D. W. Chandler, H. W. Harms and H. C. Rowland, division engineers, have been promoted to newly created positions as regional engineers in the southern, northern and western regions respectively.

J. R. Kunkel, former sales representative at Seminole, Oklahoma, has been promoted to district manager of the north Midland district with headquarters in Andrews, Texas, and S. R. Mays, former sales representative at Midland, has been promoted to district manager of the south Midland district with headquarters at Midland.

M. G. Clarke, Jr., formerly sales representative at Seminole, Oklahoma, has been promoted to special representative in Pittsburgh, Pa., where he will handle commercial activities for the company at their new flashweld plant, which is located at Walker's Mills, Pa., a suburb of Pittsburgh.

Buys Devine Equipment

As concluding phase of its $500,000 expansion program, The John Nooter Boiler Works Company, St. Louis, has purchased major items of equipment from the Mount Vernon, Ill., plant of J. P. Devine Division, H. K. Porter Company, Inc. Removal of this equipment to St. Louis together with other new equipment recently installed or now on order provides facilities for fabricating the larger type of tanks and heavier pressure vessels used by petroleum and chemical processing industries. Included in the purchase is a bending roll capable of processing steel plates up to two inches thick and to 20 feet in width.

New Agency Appointed

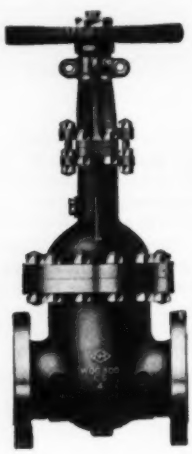
McNevin-Wilson-Dalldorf, Inc., New York, has been appointed advertising agents for The Watson Stillman Co., Roselle, N. J. Product studies are being made by the agency, and plans are in progress for the promotion of sales of both the hydraulic and fittings divisions of the company.

Dr. Heinemann Joins Houdry

Dr. Heinz Heinemann has joined the staff of Houdry Process Corp. as a project director. He has been research chemist and research supervisor with Attapulgus Clay Co., Camden, N. J.

CAST IRON & CAST STEEL
WEDGE GATE VALVES
A.S.A. SERIES 125–1500

This important range of valves for the Oil Industry are available as follows :— Cast Iron Series 125, Cast Steel Series 150, 300, 400, 600, 900 and 1,500. They conform to API Std. 600A as regards design, dimensions and materials. Illustration shows our No. 581 Series 300. Fully descriptive literature available on request.



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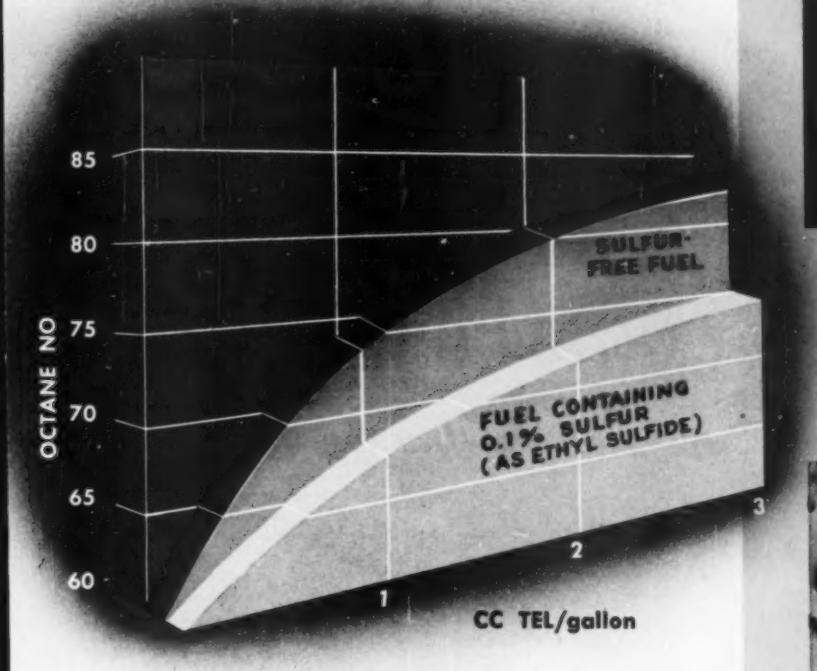


CHART SHOWING EFFECT OF SULFUR ON TETRAETHYL LEAD EFFICIENCY IN A 60 OCTANE REFERENCE FUEL

Among the problems of vital concern to the refiner is the improvement of tetraethyl lead efficiency in gasolines containing sulfur compounds. While the effect of sulfur on octane number in non-leaded fuels is insignificant, in leaded fuels it is pronounced and the chart graphically illustrates this.

Tetraethyl lead efficiency in sulfur-containing fuels can be improved by reducing the sulfur concentration. The efficiency of TEL is also dependent upon the type of sulfur compounds present, some having a more adverse effect on octane number than others. Du Pont research is working toward a better understanding of the anti-knock action of tetraethyl lead in the presence of sulfur, as well as improving the efficiency of TEL's use.

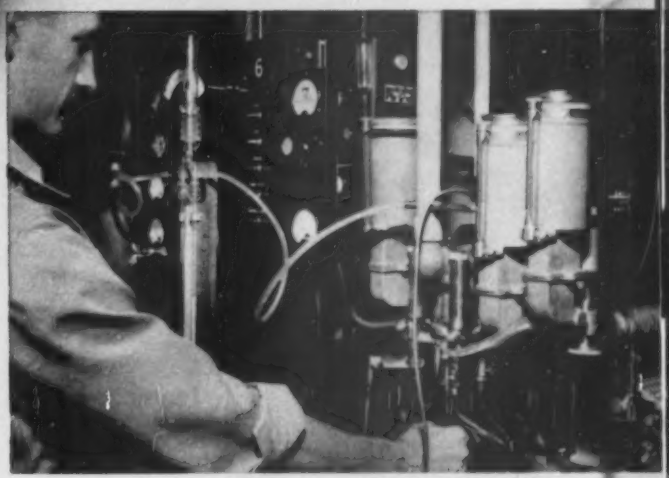
The first of a series of technical papers on the subject of sulfur in leaded fuels, prepared by Du Pont research men, entitled "The Effect of Sulfur Compounds on Octane Number of Leaded Fuels—Part 1" is now available. Write the nearest District Office for your copy.

DU PONT

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

▲ Apparatus used for laboratory experiments on sulfur.

▼ CFR engine equipped for special tests to study effect of sulfur on octane number.



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- ***Antioxidants***
- ***Metal Deactivator***
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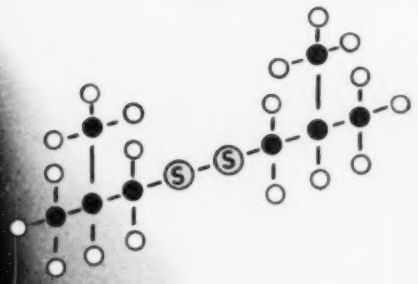
DUPONT TETRAETHYL LEAD COMPOUNDS



Du Pont Research

Work on the

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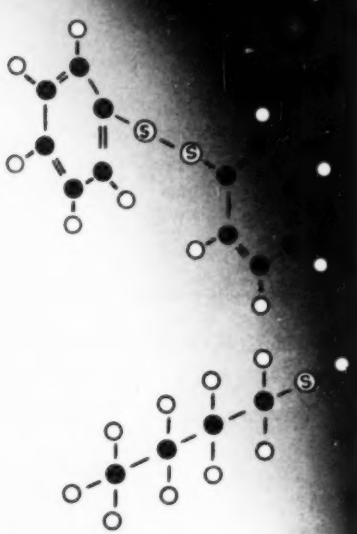
Fuels

comp
sulfur



To understand better the mechanism of the anti-knock action of tetraethyl lead, and to improve the efficiency of its use, Du Pont has undertaken a broad program of research. Among the problems being studied is an investigation into the effect of sulfur compounds upon the octane number of leaded fuels.

It has long been known that sulfur, even at the relatively low concentrations that occur in present day motor fuels, causes a significant reduction in the octane number of gasolines containing tetraethyl lead. However, the chemistry of the effects of sulfur compounds in leaded fuels has not been well understood. The many phases of this problem are being thoroughly investigated, applying chemical experience acquired over many years.

This is another example of Du Pont working to help the petroleum industry produce better petroleum products at the lowest possible cost.

DU PONT

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Better Things for Better Living . . . Through Chemistry

Panoma Corporation's new gasoline plant near Hooker, in the Oklahoma panhandle, had been only on stream a week when the first of the west's severe winter storms struck. Low temperatures were accompanied by snow and winds ranging as high as 70 miles per hour. As shown in the accompanying photograph sent *World Petroleum* by I. Earl Nutter, general superintendent, icicles were formed in fantastic patterns by the impact of the wind. The new plant passed through the storm without a shutdown which the operators considered a miracle, particularly in view of its newness.

New Discovery in Venezuela

Phillips Oil Co. has completed a discovery well on its 130,000-acre concession in the State of Anzoategui Venezuela, near the Toco, Santa Ana, San Joaquin and Roble oil fields. This well encountered several oil-saturated sands having a total thickness of 165 net feet in the Colorado section of the Oficina formation between the depths of 7740 and 8500 feet.

On production test the top zone flowed 40 gravity oil at the rate of 1,500 barrels per day on ¾-inch choke through 15 feet of perforations. The three successively lower zones produced on test at the rates of approximately 500 barrels per day, 300 barrels per day, and 500 barrels per day, all on small chokes and with gravities ranging from 41 to 45 degrees. It is planned to make a dual zone completion of this well in the top two sands.

There are two pipelines in the vicinity which transport oil to the coast, and arrangements for an outlet are now under way.

The company has recently sent additional drilling equipment to Venezuela to augment the development of this field. The new strike is approximately 70 miles west of the Mata Grande Pool where the company discovered its first Venezuelan oil in 1946.

BJ Promotes Koberg

E. R. Koberg, Baton Rouge sales engineer for Byron Jackson Co., oil tool division, was recently promoted to the company's midcontinent headquarters at Houston. Mr. Koberg was replaced by D. M. Mundinger.

Erratum

In the article by K. B. Ross and D. N. McKinlay dealing with operations of the Anglo-Iranian refinery at Abadan published in the January number of WORLD PETROLEUM, it was stated that "about 51 percent of the total products are distributed to local markets. . . ." We regret that a decimal point was omitted from the figure as published. The correct percentage of product distributed locally is 5.1.

Iranian Production

November 1948 crude production in Iran averaged 557,391 barrels daily, according to an announcement by Anglo-Iranian Oil Co. For the first ten months daily average output was 490,000 barrels daily.

W. E. TUCKER has been appointed assistant chief engineer, designs, for California Texas Oil Co. Mr. Tucker joined Standard Oil Co. of Calif. in 1942 as an engineer and has been employed by Caltex since 1944.

VOKES FILTERS
PROTECT THIS VITAL PIPELINE

In 1934 VOKES filters were chosen in the face of worldwide competition for the £10,000,000 Iraq Petroleum Company's pipeline from Kirkuk to Tripoli and Haifa. Since that time they have operated continuously in conditions of torrid heat and severe sand storms and are still giving perfect trouble-free service in the protection of electric generators, compressors, portable welding sets and subsidiary machines. Little wonder that VOKES are again providing filtration equipment for the duplicate pipeline.

Vokes filters fitted in one of the main Pumping Stations

Murex Portable Welding Set fitted with Vokes P.800 Microvee Air Filter

VOKES *Pioneers of scientific filtration*

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Factories and Agencies Throughout the World

Irving A. Cole

Appoints Laboratory Manager

Irving A. Cole has been appointed manager of technical division by Attapulgus Clay Co. in the Camden, N. J., laboratories. Mr. Cole previously was in the sales department. Prior to joining Attapulgus in 1946, he was with the research and development department of Atlantic Refining Co.

Organizes Chemical Company

Standard Oil Company (Ind.) has organized Indoil Chemical Co., a subsidiary to handle chemicals. Officers include W. B. Plummer, president and Dr. R. C. Gunness, vice president. H. R. Peterson is to be sales manager. Mr. Plummer has been manager and Mr. Peterson has been sales manager of Standard's chemical products department. Mr. Gunness is manager of research for Standard.

DAVID GORDON & CO., New York, has established associated officers in Montevideo, Uruguay, under the direction of Sr. Eduardo Araujo; and in Tananarive, Madagascar, under the direction of M. Akbaraly Daoudbay.

WARD O. LONGWORTHY, formerly mechanical superintendent of the Regina, Sask., refinery of Imperial Oil Ltd., has been appointed assistant superintendent of that refinery. Mr. Longworthy joined the staff of the Regina refinery in 1927. For several months prior to his present appointment he was acting assistant superintendent.

Joins Petrochemicals Ltd.

Dr. H. K. Whalley, who has been in charge of the chemical research department of Manchester Oil Refinery, Ltd., for the past four years, has resigned from that post to join Petrocarbon, Ltd., where he will direct the program and planning of Petrochemicals, Ltd.

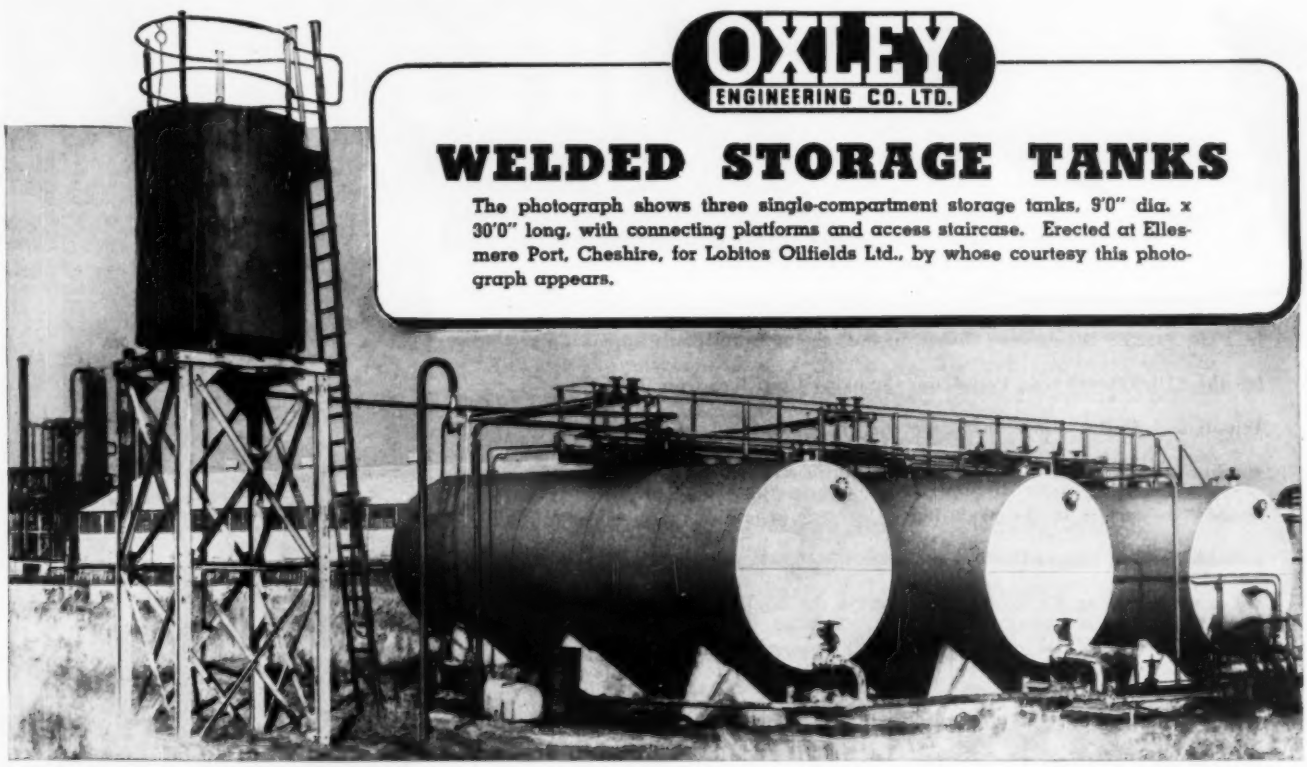
Dr. Whalley graduated from Pembroke College, Cambridge, in 1929, and obtained his PhD degree in 1932. In the same year he was appointed to the Government Chemist's Department. During the late war he was assistant director of chemical research and development in the Department of the Controller of Chemical Research and Development. He has made a particular study of the application of petroleum-derived chemicals, achieving outstanding results in the development of petroleum sulfonates.

1948 Annual Index

An index to all issues of WORLD PETROLEUM published in 1948 is now available. Copies will be sent free of charge to subscribers upon request. Please address your card or letter to Editorial Department, WORLD PETROLEUM, 2 West 45th Street, New York 19, N. Y.

E. G. Dahlgren

E. G. "TY" DAHLGREN, assistant secretary of the Interstate Oil Compact Commission, resigned Jan. 1 to become a consultant in the Braniff Building at Oklahoma City. A geology graduate of the University of Wisconsin in 1929, Dahlgren served in the geological department of the Indian Territory Illuminating Oil Company until January, 1931, when he joined the Oklahoma City Producers' Association. Later he served the oil and gas conservation departments of Oklahoma and Kansas. He joined the Interstate Oil Company Commission in 1942.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ENGINEERING CO. LTD.
WELDED STORAGE TANKS
The photograph shows three single-compartment storage tanks, 9'0" dia. x 30'0" long, with connecting platforms and access staircase. Erected at Ellesmere Port, Cheshire, for Lobitos Oilfields Ltd., by whose courtesy this photograph appears.

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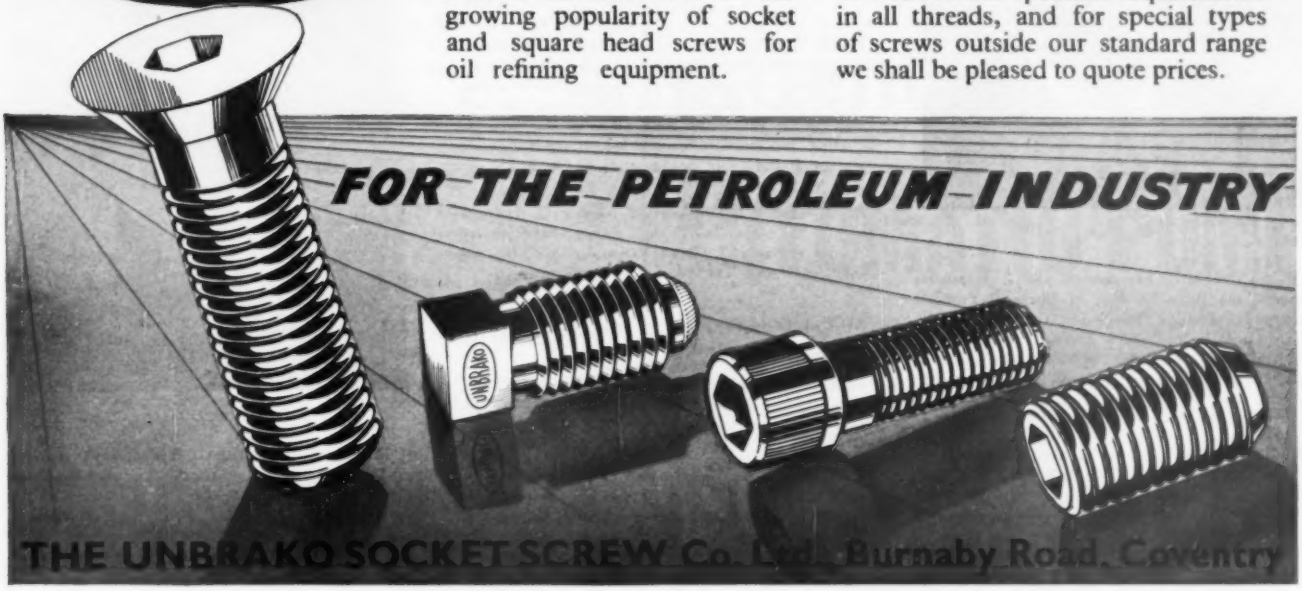
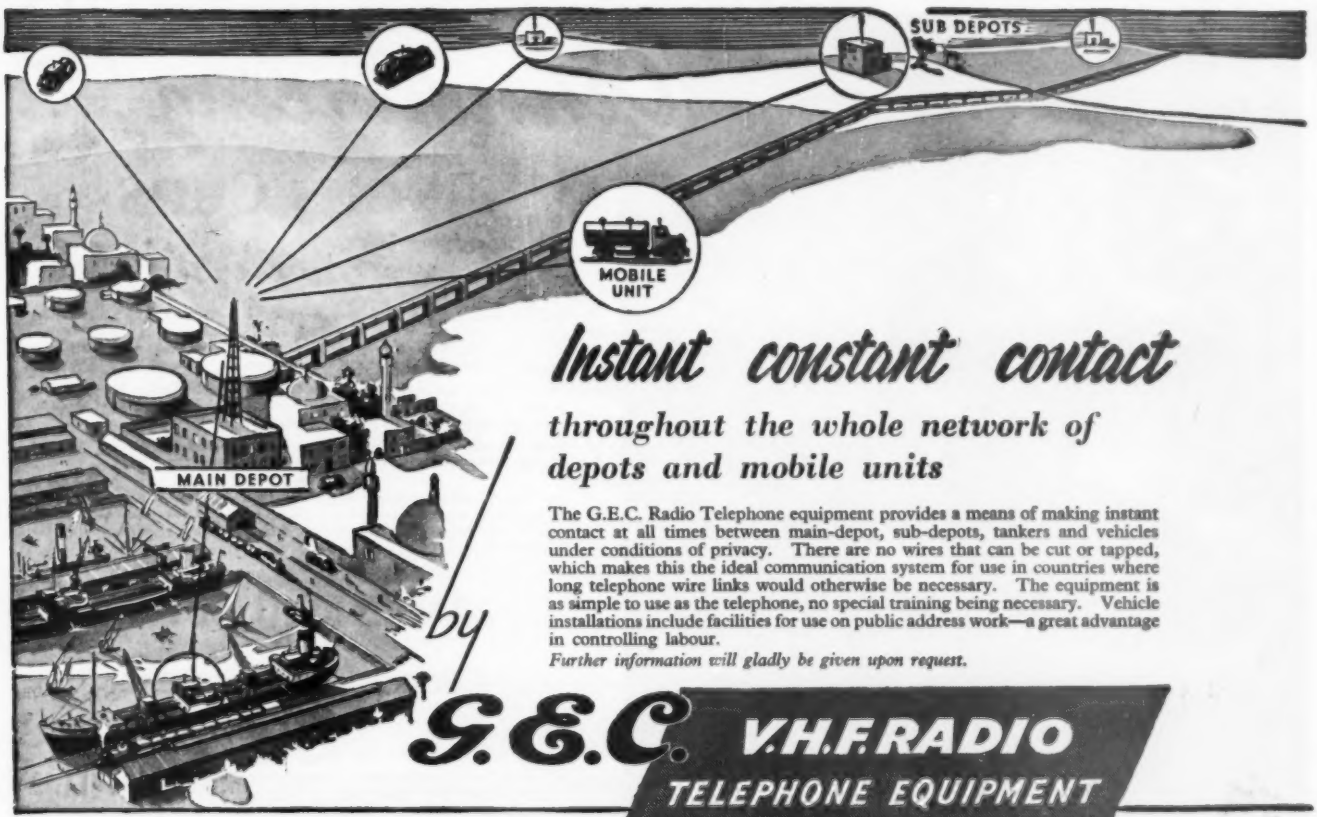
Unbrako screw products and replacement parts in stainless steel can be made to suit specified requirements in all threads, and for special types of screws outside our standard range we shall be pleased to quote prices.



THE UNBRAKO SOCKET SCREW Co. Ltd., Burnaby Road, Coventry



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Further information will gladly be given upon request.

by G.E.C. V.H.F. RADIO TELEPHONE EQUIPMENT

The General Electric Co. Ltd. of England, Magnet House, Kingsway, London, W.C. 2

J. W. Sandberg

J. W. SANDBERG has recently joined, as process engineer, the Perco Division of Chemical Products department, Phillips Petroleum Co., Bartlesville, Oklahoma. Mr. Sandberg is a 1940 graduate of McGill University, Montreal, with a B.E. degree in chemical engineering. He comes to this country after spending over six years in Trinidad at the refinery of Trinidad Leaseholds, Ltd.

CHARLES A. OSBORN, a member of Standard-Vacuum Oil Company's India staff since 1920 and manager of the Bombay office for the past ten years, retired Jan. 1. During the war years he played a key part in the distribution of petroleum products to the Allied military forces in the China-Burma-India theatre.

J. R. POLSTON succeeded J. B. Harshman as general manager of Stanolind Pipe Line Company on Jan. 1. Mr. Harshman became general manager of the Utah Oil Refining Company at Salt Lake City, another Standard of Indiana affiliate.

Mr. Polston was assistant general manager in charge of engineering and construction. His pipeline and oil refining experience includes periods as construction superintendent for the former Marland Oil Co. and engineer for Arthur G. McKee and Co.

FRED E. LINK has been appointed general works manager for Oil Well Supply Co. For the past year he has served as assistant to the president in charge of Oil Well's manufacturing department. He will continue in charge of manufacturing activities, including industrial relations, industrial engineering and production, with headquarters at Dallas.

N. M. JONES, for 16 years a member of the sales staff of the Macmillan Petroleum Corp., has been appointed manager of the lubrication division. He will continue to make Los Angeles his headquarters.

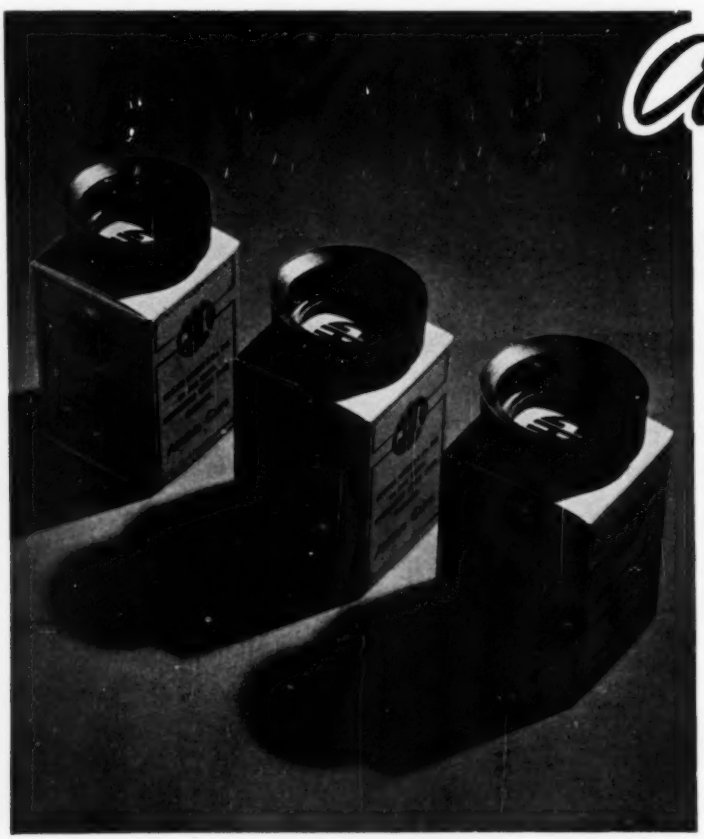
JACK A. COLLINS has been appointed administrator of purchases, production department, Sun Oil Co. He will coordinate the purchasing activities of Sun's production offices in Dallas and Beaumont, Texas; Tulsa, Okla.; Evansville, Ill., and Toledo, Ohio. His office will be in Dallas.

T. S. GREEN has been named chief geophysicist of Sunray Oil Corp., Tulsa. He was previously associated with Seismograph Service Corp., Engineering Laboratories, Inc., and for the past three years he has been with Republic Exploration Co. handling geophysical work in southwest Texas for Sunray.

JOHN F. CULLEN, Rocky Mountain division manager for Stanolind Oil & Gas Co., at Casper, Wyoming, has been named division consultant at his own request. He is succeeded as division manager by Carl L. Larson, Jr., formerly division exploration superintendent at Casper. William McCabe, division geologist, is promoted to the exploration superintendent's post.

C. R. Allen

C. R. ALLEN, Continental Oil Company's regional production manager, Los Angeles, has been appointed general manager of all company operations in the Pacific Coast area. Mr. Allen joined Continental nearly 25 years ago. B. H. Anderson was named general production superintendent for the Pacific Coast region.



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Angus Cups—the first high-grade Valve and Seating Cups of British manufacture—are now available to Oil Field Engineers. Produced from "Gaco" Fabric composition, an extremely tough and wear-resisting compound, with our famous "Gaco" synthetic rubber as the bonding medium.

Layers of fabric are impregnated with "Gaco" and moulded under heavy pressure to form a tough compact composition capable of resisting the action of abrasion, crude oils and gases at high working pressures and temperatures.

Years of intensive research are behind the development of Angus Cups. Supplied in three hardnesses, sizes as laid down by A.P.I. standards.

★

Our "Gaco" synthetic material, which achieved a wide reputation before and during the late war as a medium for hydraulic sealing in aircraft and engineering mechanisms, is also now available for the manufacture of other products used in the Oil Industry.

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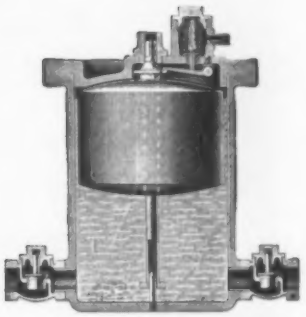

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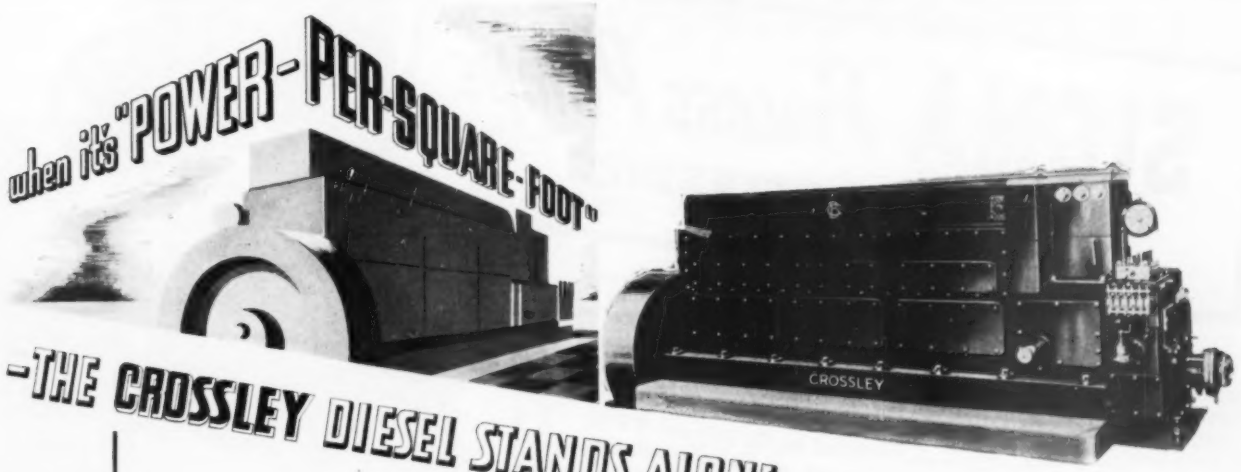
combines the good qualities of a pressure pump and a vacuum trap. Pumps condensate from low-pressure or vacuum vessels and lifts up to fifty feet; pumps boiling, cold or gaseous fluids (including oils); pumps petrol, benzine, dye liquors and alkaline liquors such as caustic, ammonia, etc.; drains sump holes, pits, excavations (where it may be fully submerged). ENTIRELY AUTOMATIC. *Details of "Ogden's Patent Pump" (in five sizes) from:* OGDEN & CUNLIFFE, 2 Clifton Road, Prestwich, Manchester, Eng.



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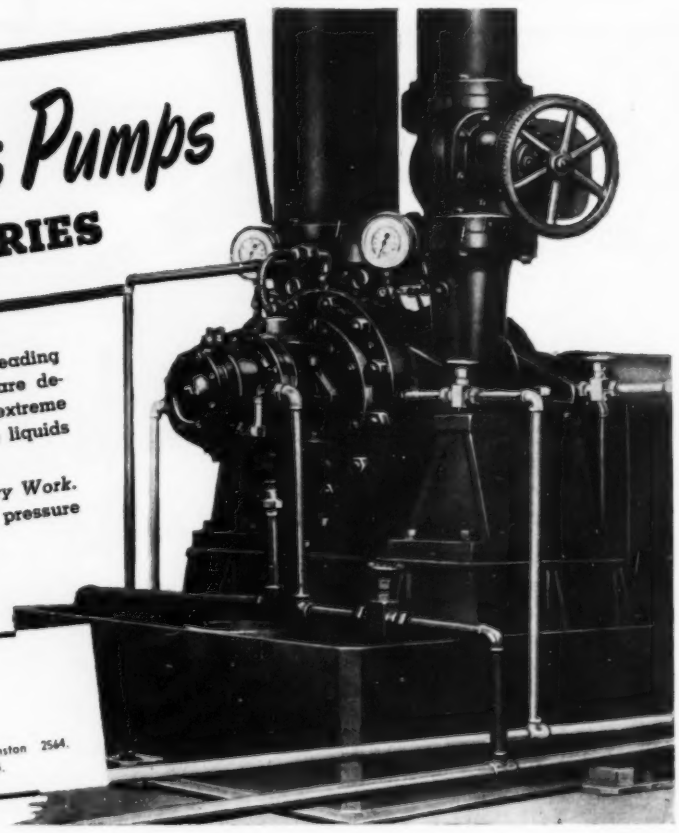
SIGMA *Process Pumps*
FOR OIL REFINERIES



Sigmund Process Pumps are built to the specifications of the leading Oil and Chemical Companies throughout the world. They are designed to deal with difficult pumping problems, where extreme temperatures, high pressures, and corrosive and/or volatile liquids are to be handled. A comprehensive range is available.

This pumping unit is one of many supplied for Oil Refinery Work.
DUTY 1840 imp. g.p.m. against 238 lbs per square inch pressure at 460°F.

MATERIAL 18/18/3 Stainless Steel.

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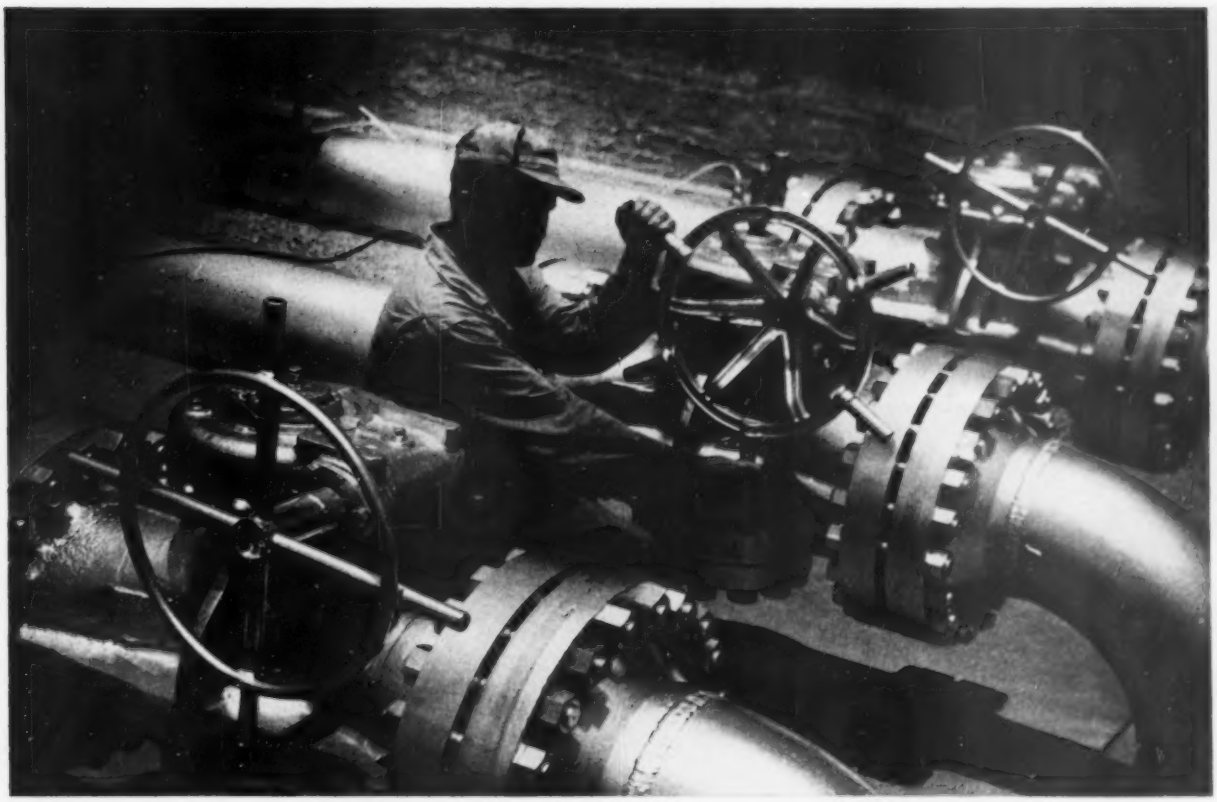
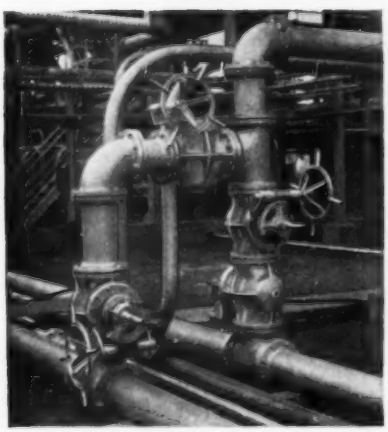
and at
Glasgow: Giffnock 2005. Ayr: 2755. Newport, Mon.: 71426. Manchester: Urmston 2564. Derby: 47504. Nottingham: 41226. Bristol: 20265. Dundee: Broughty Ferry 7884.

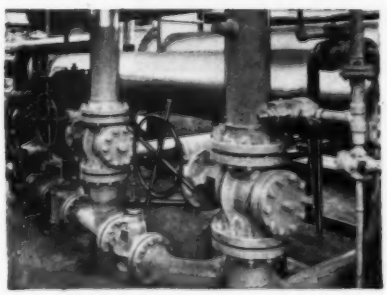
SIGMUND PUMPS LIMITED, TEAM VALLEY, GATESHEAD 11, ENGLAND Tel. 75051/8



Audco-Nordstrom

BRITISH AMERICAN

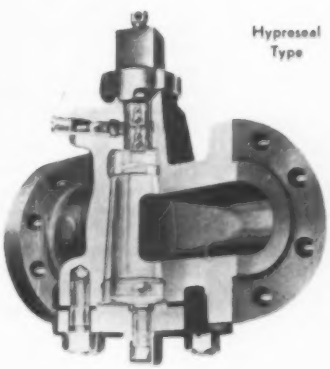




—the lubricated valves that give longest life

—the protected seat is not exposed to the line

Before the advent of Audco-Nordstrom valves, abrasion and corrosion were evils that struck fatal blows at valve life. Audco-Nordstrom design has mastered this problem. Tapered rotary plug design eliminates vulnerable areas. In place of an exposed seat where rapid wear can occur, the plug and body interior present a smooth, streamlined passage so that line fluid flows through unimpeded, never in contact with the seat.



Hypreseal Type

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Newport, Shropshire, England

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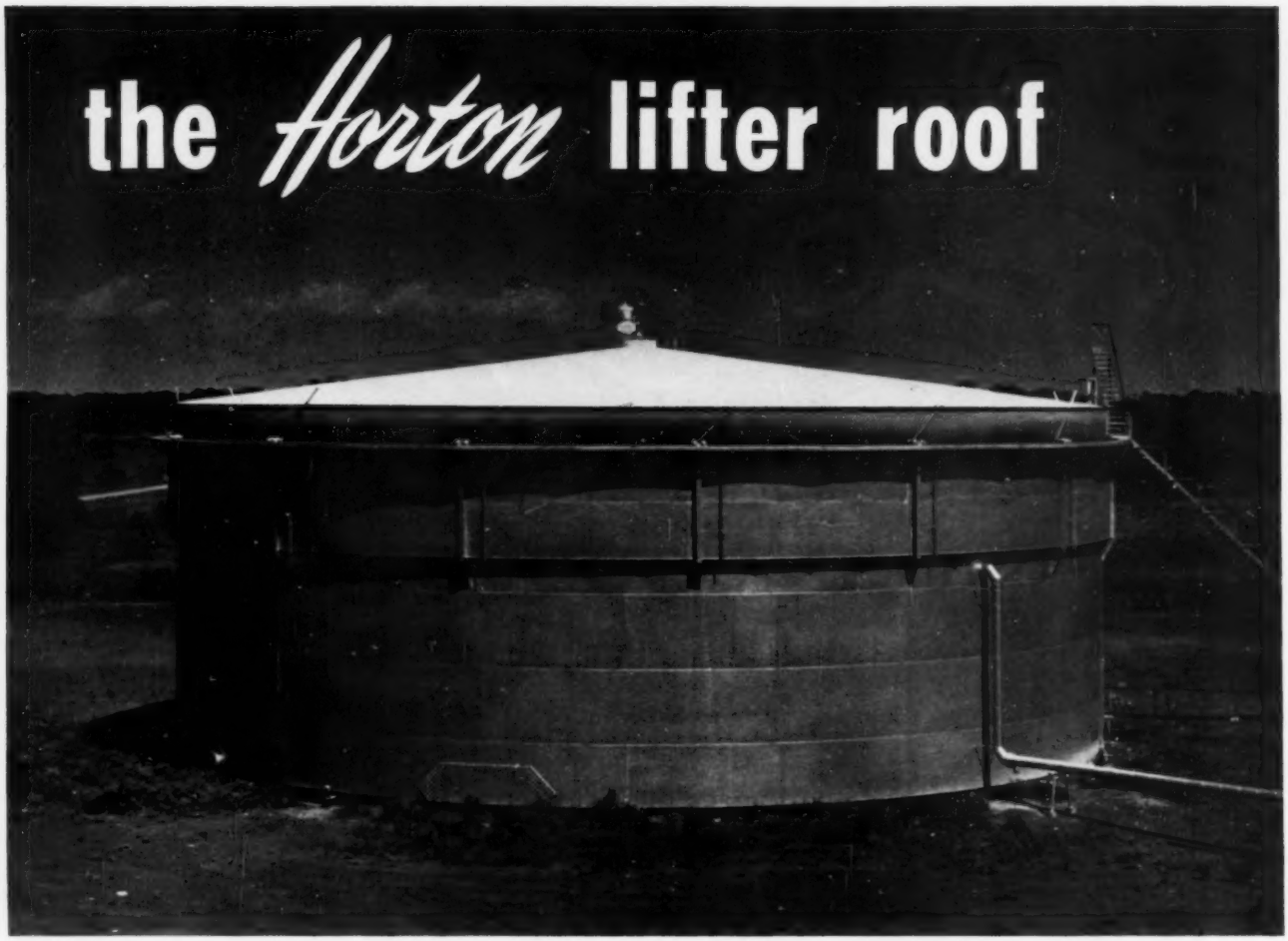
Export:
Rockwell International Corp.,
7701 Empire State Bldg., New York 1, N. Y.

Canadian Licensees:
Peacock Bros., Ltd., Montreal, Quebec

the *Horton* lifter roof

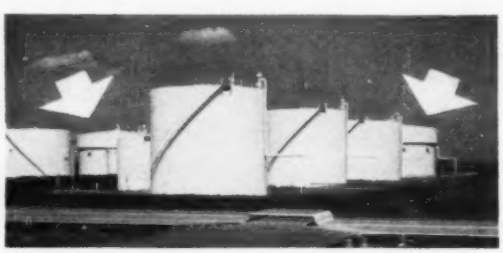


...combines with ordinary tanks into vapor-saving systems

The above view shows an 80,000 bbl. tank equipped with a Horton Liquid-Seal Lifter Roof at a pipe line terminal in Texas. The vapor-spaces of adjacent cone-roof tanks are connected by large-diameter vapor piping to the expansible vapor space under the Lifter Roof. When rising temperature causes the air-vapor mixture to expand in the Lifter Roof tank, and in the fixed-roof tanks, the roof moves upward on the expanding vapor. When the vapor contracts, the roof rides back down. That's how the Lifter Roof allows expansion and contraction without drawing fresh air into the tank or venting air and vapor. As a result, costly "breathing" losses are stopped.

If you are now handling volatile crude oil or gasoline in fixed-roof tanks, or if you're planning entirely new storage facilities, ask our engineers to show you how to use the Horton Lifter Roof. Our nearest office has full details.

Above: An 80,000-bbl. tank with a Horton Lifter Roof at the Products Pipe Line Terminal of the Humble Oil & Refining Company at Baytown, Texas. Below: A view showing some of the storage facilities at the Great Lakes Pipe Line Company's Fargo, North Dakota, terminal, showing two Lifter Roof tanks interconnected with fixed roof tanks.



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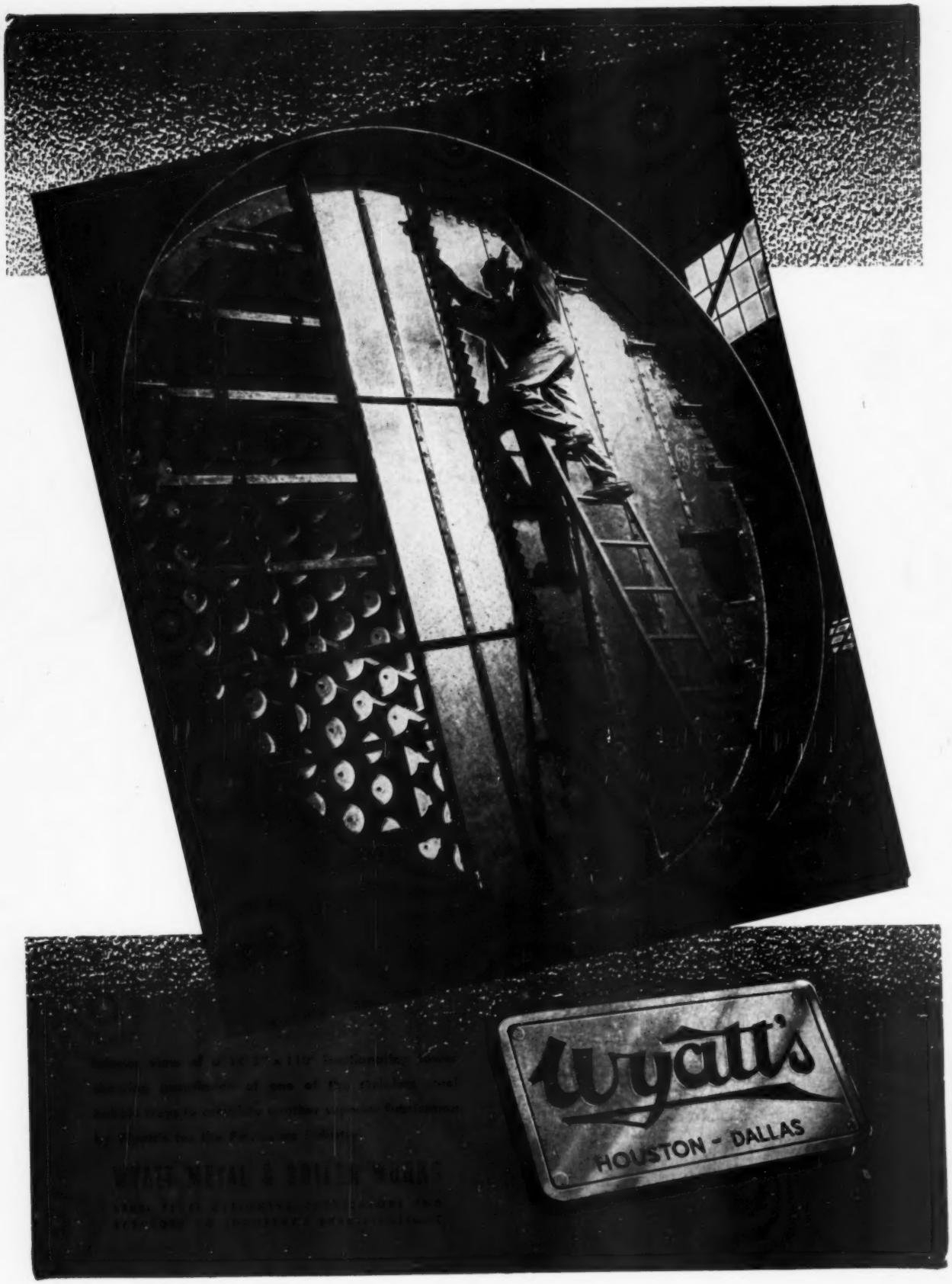
"FOR FULL UNCONTAMINATED CORES YOU CAN DEPEND ON A HUGHES CORE BIT"

HUGHES TOOL COMPANY HOUSTON, TEXAS

Standard of the Industry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